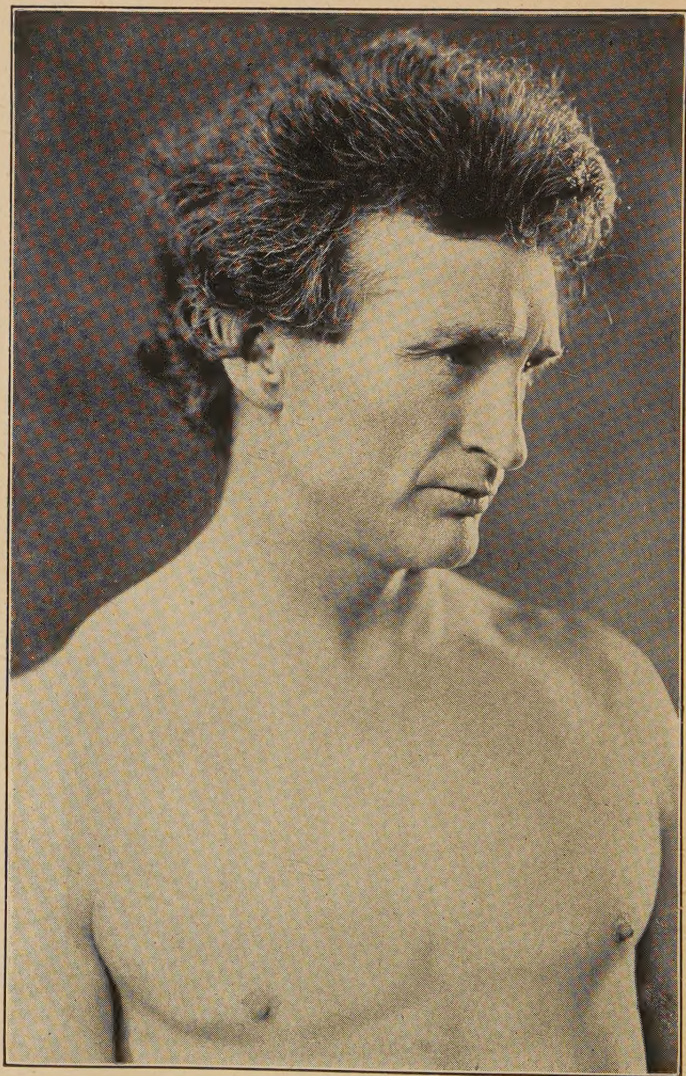


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Portrait of the Author

Strengthening **The NERVES**

BY

BERNARR MACFADDEN

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EATING FOR HEALTH AND STRENGTH, STRENGTHENING THE EYES,
HAIR CULTURE, CONSTIPATION, TOOTH TROUBLES, MIRACLE OF
MILK, PHYSICAL CULTURE COOK BOOK, HEADACHES, STRENGTHEN-
ING THE SPINE, AND OTHER WORKS ON HEALTH AND SEX

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PREFACE

NERVES!

Wealth "covers a multitude of sins;" so "nerves" cover a multitude of ills—of the body, mind and soul.

This is an age of nerves. We have been gradually rushing pell mell toward marked and more marked nervous instability, though modern life has been constantly and gradually producing a responsiveness of the nervous system that has enabled us to endure the nerve-stimulating modes of life without complete annihilation.

The stimulation, excitement and nerve-bombardment that make for weak and unstable nerves have reached every human habitat, except perhaps in forest wilds and mountain retreats. But in the cities and the less pretentious social bulwarks we find the greater aggregation of influences for producing enervation and infirmities of the nervous system. To our ears comes the grating, jarring street car to a stop. The honk-honk of the speeding motor car shocks us into a tremble as the car seems almost upon us. The grinding roar of the electric elevated trains comes from above. The motor-hissing, clattering motorcycle with its swaying sidecar races by. The ding-dong of the fire engines clears the traffic but in doing so adds to the myriad of noises. From the distance is heard the varying cries of the street hucksters, reaching harsh, penetrating pitches as they draw nearer. School is over

for the day and thousands of boys and girls run to and fro, adding their joyous glee to the din. All these combine to produce the daily ear-piercing and nerve-shattering pandemonium.

In factories, mills and business offices, the thousand and one noises of machinery, typewriters, telephone bells, etc., all add to the din and tumult and the constant stream of sensations battering at the nerves.

Even in the home one does not escape the nerve bombardments. The playing, crying, laughing, fighting of the children, the clash of the dishes, the hurrying here and there, all help to keep the nerves on edge and key one up toward the snapping and breaking point. The radio sends into many homes its discordant notes and its jarring jazz and provides the stimulus for the exhausting dance far into the night.

Combine all these noises with improper diet and lack of exercise, fresh air and sleep, and you have been introduced to neurasthenia, hysteria and nerve exhaustion or prostration.

Many readers will be interested in the causes and relief of various forms of nerve weakness. Some of you suffer from insomnia or inability to sleep. You will learn of the relation of these conditions to the nerves and find ways of relief by means of strengthening the nerves. Others are seeking knowledge of the various forms of occupational neuroses; in other words, the peculiar fears and obsessions connected with particular labors.

Those who suffer from neuritis, or inflammation of the nerves, will gladly read these pages and find consolation that cure lies within their reach. Similarly,

sufferers from chorea and habit spasms will find the close relationship existing between these disorders and nerve weakness, and discover hopes and possibilities for permanent relief or cures. Then it will be shown very clearly that both apoplexy and epilepsy are primarily based upon a weakness of the nerve system. It will be learned that through proper care and control of the nervous system it is possible to prevent the arrival of these disastrous bodily disorders. Lastly, we shall discuss the causes and results of infantile paralysis, and explain means of improvement and, perchance, ultimate complete recovery.

I will bring you hope in these pages.

I will show you ways and means for relief.

I will show you means whereby the nerves may be steadied.

I will show you how you may obtain or maintain a sound and stable nervous system by proper living.

This book will explain in simple language what you should know about the structure and functions of your body and the causes of and the remedies for erratic action of its nerves. A builder must know his materials, tools and methods to build a house; so you must know your composition and structure, and the means at your disposal whereby you may build a perfect body or repair a damaged body, before you will be enabled to become master of yourself.

Remember that you are largely a bundle of nerves, therefore easily un-nerved. You are only as healthy as your nerves. When your nerves act normally and rationally, you are physically, mentally and emotionally sound. No matter how muscularly strong you may be

you will never be sound unless your nerves are under control.

This, then, is my message to you. Read carefully. Think clearly and calmly. Follow instructions, and be patient. It will then follow as the night follows the day that your nerves will be sound, and instead of being a slave to your nerves you will be master of them.

Pernarr Macfadden

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STRENGTHENING THE NERVES

Strengthening The Nerves

CHAPTER I

Anatomy of the Nerve System

COMPARE your body with an automobile. Each has size, form, curves, and straight lines. Lift up the hood of the car and you see the machinery—motors, pistons, pipes, rods, casings, and whatnots. If you could likewise observe the mechanism of your body you would see the structures that make it a serviceable body—lungs, heart, stomach, intestines, etc. Take away the machinery of the car and you have left the chassis on four wheels and the useless body. Remove the organs of the body and there are left only the skeleton and its covering of lifeless skin. Just as the chassis is the framework of the automobile, so the skeleton is the framework of the human body.

You have frequently seen and admired the beautiful, graceful chassis of some model car. Whether you own or hope to own a car, you have been delighted with the intricacies and evidences of efficiency of the denuded vehicle. But is it not much more reasonable that you should look upon the skeleton of the human body—the finest architectural

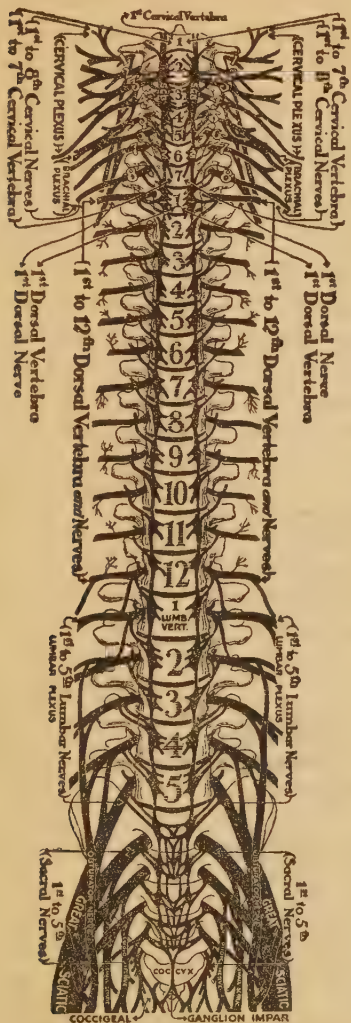
product of the universe—with the deepest admiration and appreciation? It is your own, and the only one you will ever possess. When properly fitted with organs, glands, muscles, pipings, and all other structures, it is a marvelous structure. It contains the finest camera, the most delicate sound-box, the most perfectly constructed fueling apparatus, the most efficient pump, the most elaborate water, irrigation and sewer systems and the greatest system of telephones and telegraphs.

You drive your car. You supply fuel for its consumption—oil and gasoline. You steer it, pedal it. For you it goes, it stops. You clean it, wash it, and occasionally repair and replace used and worn-out parts. Step out of the car and it is useless. Without you it is a helpless mass. It needs a guiding power that it may render service and be of value, either as a car of pleasure or of business. You are its brain—controlling, regulating, and directing it.

In much the same way you control or govern yourself. You direct the feeding, the working, the using of you, yourself. As you were the brain of the car, so your own brain is the centre of control of your body. You are or would be deeply interested in the operations of your car; you should be vastly more interested in the operations of your body.

The system of control for this wonderful mechanism is known as the Central Nerve System. Let us examine it quite closely and see what we shall find. At the top of your body, underneath the dome of the skull, is the brain. It is largely a mass of gray matter, containing millions of nerve-cells grouped in nerve-

ANATOMY OF THE NERVE SYSTEM

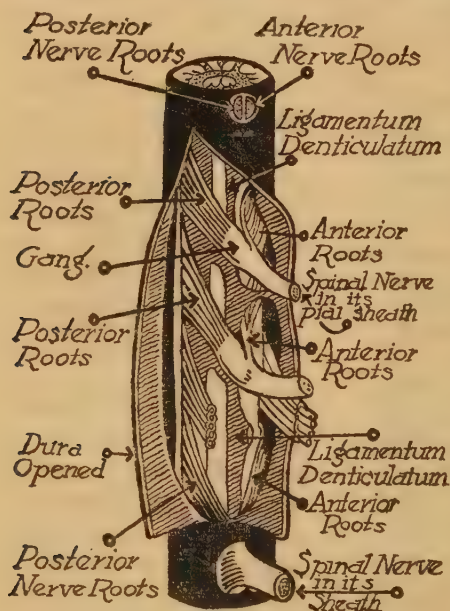


Frontal view of vertebral column and spinal nerves.

centres. The nerve-cells in each of these centres control and direct some specific area of the body, much as the district telephone is connected with and controls a certain outlying group of home and office phones. This control, direction or management of the muscles, bones, blood, organs, and other structures is carried on through nerve-fibres—extremely delicate and sensitive “wires” running out of the nerve-cells to every minute part of the body.

Just as telephone trunk lines are made up of cables formed by the interlacing of innumerable strands of fine copper wires, so we find more or less corresponding trunk lines of nerves in the body. Extending down from the brain through the centre of the spinal column, which can

be easily felt running down the middle of the back from the head to the pelvis, are the great cables. These cables are collectively called the spinal cord. All along the spinal column are small openings on either side through which pass the trunk lines, called the spinal nerves. Counting from above downward, there are eight pairs of cervical (neck) nerves,



Spinal Cord, showing how spinal nerves are formed. The outer covering (dura mater) is split and drawn aside.

lumbar nerves, five pairs of sacral nerves, and, at the tip, one pair of coccygeal nerves—thirty-one pairs in all.

Returning once more to the brain we find upon close examination a brain system of nerve-cables. These are called the cranial nerves, and are twelve in number. These nerve bundles chiefly activate the principal

sense organs of the body. They are numbered from

one to twelve, according to their arrangement from front to back within the brain. Each of these twelve nerves has a specific name indicating the structures supplied and the principal functions performed, as follows:

1. The Olfactory nerve, to the nasal mucous membrane and concerned with the sense of smell.

2. The Optic nerve, intimately connected with the retina of the eye and devoted to vision.

3. The Oculomotor nerve, to several of the muscles attached to the eyeball and by which some of the movements of the eye are controlled.

4. The Patheticus or Trochlear nerve, with somewhat similar control, though it supplies but one external eye muscle.

5. The Trifacial or Trigeminus nerve, the chief nerve of sensation of the face and also controlling the muscles of mastication.

6. The Abducens nerve, by which one other pair of eye movements is regulated.

7. The Facial nerve, to the muscles of the face for controlling facial expression.

8. The Auditory nerve, to the intricate structures of the inner ear and concerned with the sense of hearing.

9. The Glossopharyngeal nerve, a nerve of general sensation and of taste distributed to the tongue, middle ear, tonsils, pharynx, and brain coverings.

10. The Vagus or Pneumogastric nerve, a large nerve trunk of sensation and motion, which brings many of the principal organs of the body (the pharynx, larynx, heart, lungs, esophagus, stomach) into direct connection with the brain.

11. The Spinal Accessory nerve, to the muscles of the neck and, by connection with the Vagus, to the heart.

12. The Hypoglossal nerve, mainly to some of the muscles of the tongue and throat.

Both in the brain and in the spinal cord the nerve substance consists of two masses, one gray and the other white. The gray mass is composed of the nerve cells, which are found in every level of the spinal cord from the base of the brain to the end of the cord. The white substance is composed of the nerve-fibres.

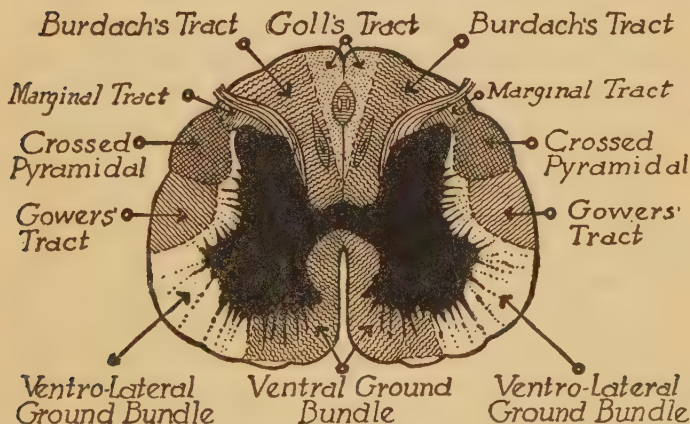
The nerve-cells of the brain form the primary or main power-station of the entire nerve system, whereas the groups of nerve-cells in the different levels of the spinal cord form the secondary or sub-stations.

For a moment we shall turn our attention to the skin, the external vestment or covering of the entire body. Underneath this structure are myriads of fine nerve-fibres and their endings or terminals, numbering approximately 15,000,000. These highly sensitive terminals act as receivers for the body of stimuli coming from the outside world. In tracing these terminals and their fibres backward we find that they commingle with other similar fibres and finally enter the spinal nerve-trunks. This may be better understood if we compare them with streams of melted snow that unite with similar streams, these forming rivulets, which unite to form brooks, these forming rivers, and finally is formed the great river that flows into the sea. But we must be careful to note a distinction in our comparison: whereas there is only one river bed and the water flows one way only, the nerve-trunks contain

ANATOMY OF THE NERVE SYSTEM

groups of nerve-bundles and nerve-fibres which permit a two-way flow of nerve impulses. Every pair of spinal nerves contains nerve-fibres which conduct or carry impulses, stimuli or excitations from the skin into the spinal cord and brain, and are known as the afferent or sensory nerve-fibres; and nerve-fibres which carry or transmit conduction-waves or nerve-energy or messages from the brain and spinal cord to the sense-organs and muscles of the body, and are known as the efferent or motor nerve-fibres.

Closely connected with the brain and spinal cord is



A diagrammatic cross section of the spinal cord at the dorsal region, showing the various columns or tracts of fibres that descend in the cord.

the sympathetic nervous system—at one time believed to be an independent system but now conclusively proven to be part of the one nerve system. It is not necessary for me to give an analytic and minute dis-

discussion of this part of the nerve system, yet some basic understanding is necessary for us to interpret more readily or more nearly the innumerable petty nerve disturbances which seem to have no particular cause.

The sympathetic system may be divided into two divisions—one, the autonomic system, the other, the true sympathetic system. The former includes all those sympathetic nerve-fibres found in company with some of the cranial nerves and with many of the spinal nerve-trunks. Instead of going out and entering into the skeletal muscles they first enter ganglia—great nerve masses containing nerve-cells. These nerve-fibres arborize or spread out around the nerve-cells in the ganglia like the branches of a tree, then come out again and pass on to the muscles of the blood vessels, the heart, and many of the other structures that govern our mere animal existence. The other division (the true sympathetic nerve system) includes, first, two parallel chains of gangliated cords, running down alongside the spinal column, from the base of the brain to the tip of the coccyx, the terminal of the spine; it also includes collections or groups of ganglia, in the head, the face, the chest, the abdomen, and the pelvis. Another name given to this system is the vegetative system, meaning that division of the entire nerve system devoted mainly to life and growth.

The nerve-fibres of the vegetative system include both afferent and efferent conductors. In other words, the waves of excitation come from the outside world to the inside, and the waves of conduction pass from the governing centres outward,—to the organs, muscles, glands, etc.

If we examine closely the various nerve-fibres we see that their structure is much the same for all classes of nerves, except for size; we also see that fibres come from the spinal column and enter into the sympathetic system, and that fibres pass from the sympathetic and enter into the spinal system. Hence, only for convenience has the complete nerve system of man been anatomically divided into systems—the cerebrospinal system and the sympathetic system.

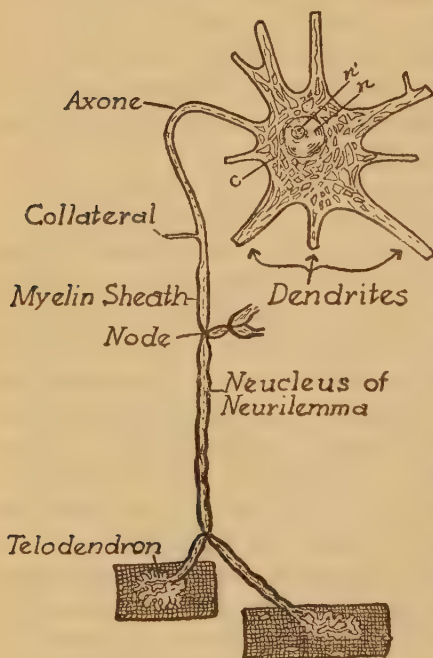
This leads us, then, to look more closely into the anatomical structure of the final basis of the nerve system, the *neuron*. A neuron is a nerve-cell in the completest sense of the term. Ordinarily the term cell means the simplest unit of life and consists of an indefinite mass of protoplasm. But a neuron is considerably more than this, for not only is there the usual mass of living protoplasm but there are also more highly specialized structures, or extensions. These extensions are particularly adapted to enable the nerve-cell to play its high part in the multiform duties of the nervous system, and they are of two kinds.

One kind consists of numerous small branches or short projections, that frequently almost completely surround the cell body itself. These are known as *dendrites*. The other form of projection or process is a single prolongation many times the length of the cell itself; there may be one or two of these, rarely more. These processes are called *axons*, *neuraxons*, or *neurites*. Quite frequently, at one or more points on the neuraxon a branch extends out at right angles and is known as a collateral. When the neuraxon reaches its termination it may end either in a brush-like ar-

rangement or in a bulb or knot; these are frequently called "end-buds" or terminal "buttons." When there is a long distance between a nerve centre and the controlled muscle or

other structure, the dendrite of one nerve-cell may branch around the terminal end of the axon of another nerve-cell and such extensions may be met several times in the passage of an impulse from "headquarters" to the final delivery point. The dendrites and the axons of a single nerve-cell together are called the process of the neuron.

All the organs of the body possess a great number of nerve-fibres



A nerve cell and its projections.
 c—cytoplasm, or protoplasm;
 n—nucleus; n'—nucleolus.

and nerve-cells. Often on or in an organ a great plexus, consisting of an interlacing net-work of nerve-fibres and nerve-cells, may be seen. Through these nerves the organ receives the stimulus for activity.

The nerve trunks or cables do not merely connect the organs with the spinal cord and brain, but also with one another. You can then readily see the intimate association and relationship between all the organs and the nerve system itself. The harmony of the members of a physiologic apparatus—as in digestion, the organs from the mouth to the intestines—is maintained through the nerve system.

To summarize our brief anatomical study of the nerve system we have observed:

1. The nerve system as a complete unit.
2. The division of this complete unit into two main divisions:—The Cerebrospinal system, composed of the brain with the cranial nerves, and the spinal cord with the spinal nerves; and the Sympathetic or Vegetative system, composed of the autonomic group and the true sympathetic group, with its chain of ganglia and gangliated plexuses.
3. The twelve pairs of cranial nerves, communicating with and leading from all principal sense-organs.
4. The thirty-one pairs of spinal nerve-trunks, containing both incoming and outgoing nerve conduction fibres, giving sensation and motion to the various parts of the body.
5. The neuron, the basic unit of the nerve system, with its processes.
6. The intimate association and connections of all the organs of the body with the brain and spinal cord and with one another.

CHAPTER II

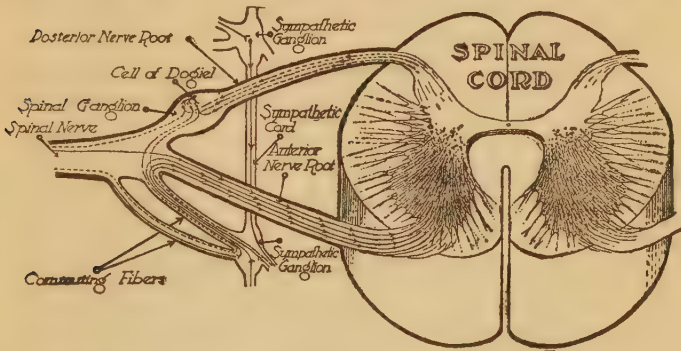
Physiology of the Nerve System

IF you were to stop a moment from your duties or pleasures and give a thought to the body which houses you, you could not help but admire the greatest single-piece mechanism of the universe. A careful study of the structure and working operations of the human being will lead you to conclude that neither on the earth, nor in the heavens above, nor in the waters beneath is there anything more perfect. It possesses the finest camera in all the world—the eye; the most delicate sound-box—the ear; the most efficient bellows—the lungs; the most sensitive ventilating mechanism—the skin; and so on. And to climax it all, it has the most elaborate, the most intricate, and the most perfect telephone and telegraph system to be found anywhere, now or ever—the nerve system; and the whole is under some degree of conscious control by a reasoning, thinking brain not found in any other mechanism.

At present you are particularly interested in the nerve system—in the actual operation of the transmission of energy and the reception of sensations through and by means of the nerve system.

Telephone and telegraph systems receive messages, the former from an individual house, business, or office telephone, the latter from an individual telegraph station. In a central telephone office all the incoming messages must be received and then proper connections made with individual telephones, if they be within the

same district, or with another central telephone office that controls the telephones of the required districts. In the case of the telegraph the message is relayed from one station to another until the proper one is



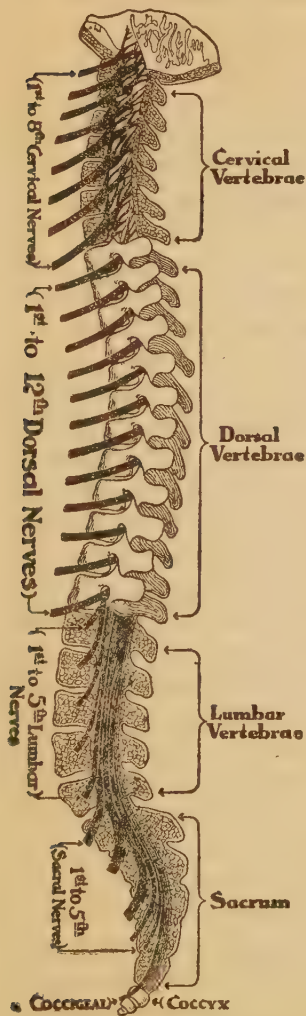
Showing a cross section of the spinal cord, with origin of anterior and posterior nerve roots, formation of spinal nerve, and connection with it of the sympathetic nerves (Diagrammatic).

reached. In both the telephone and telegraph operations not only are conversations and messages conducted back and forth but there is also a systematic coördination so that the proper parties are connected and the proper wires and phones are used.

Let us then examine in the same way the nerve system of man. All the nerves of the human body may be considered as forming one great unit, with a two-fold function: the one, to direct the activities of all the organs, tissues and cells within the body; the other, to bring the outside world within the human consciousness. The former function may be compared with the work performed at the central office of the telephone

company, namely, to attend to all the wires, receive the calls, then to call the correct station, keep the lines in repair, etc. The latter function may be compared with the work of the telephone transmitter, wires, and receiver, which receive the messages in one place and report them in another.

The functions of the nerve system will be still better understood if we trace certain procedures within the body. Let us take one important set of functions and see how they dovetail together and depend largely one upon another. For illustration, you enter your dining-room and see the table set, which gives you a pleasurable feeling. From the kitchen there comes to your nostrils the odor of cooking foods. You inhale and are agreeably thrilled. You sit at the table and enter into pleasant conversation with other members of your family. You feel contented. The food is brought to the table and you begin the meal. The process of preparing the food for mastication and the process of mastication itself excite a noticeable flow of saliva, which intermingles with the food. The food is swallowed—passing through the esophagus or gullet into the stomach. Within the stomach other fluids are discharged from the cells in the stomach walls, and these mix with the food, which in time passes into the small intestines. Here still other changes take place in it, brought about by another group of fluids, from the intestinal walls, the liver (by way of the gall bladder), and the pancreas. Most of the foods that have now been fully digested will pass through the walls of the intestines into the blood, which carries them to the liver, from where they finally go back into the blood to be



The vertebral column and spinal nerves.

carried to the various organs and tissues of the body. That portion of the food that can never be digested is sent into the large intestine and finally eliminated from the body.

Very briefly we have just covered the work of all the organs concerned with the process of digestion, which included the teeth, the mouth, and the glands of the mouth, the tongue, the gullet, the stomach and small intestines and the glands and muscles of these organs, the liver, the pancreas, the large intestine with its muscles, and the rectum. Each and every one of these organs had to perform its work, separately and collectively and consecutively. Numerous nerves had to send impulses in order that the meal be masticated, digested, assimilated, and the waste eliminated; those to the glands of the mouth excited them to discharge their fluids; similarly the nerves

to the glands of the stomach excited the glands there to secrete their fluids; and those to the muscles of the stomach aroused them to contract and relax to meet the oncoming flood, and to send it ahead. And so on, through the entire process, the nerves were the messengers that aroused and excited all the structures to digest the food, one after another and together. The various pleasurable reactions that come through the sense organs—the eyes, ears, nose—had no small share in the digestion, by stimulating the various structures to normal action.

Let us return to the telephone and telegraph illustrations for a moment. When we consider the multiplicity of operations necessary in transmitting the thousands of messages received and sent in a single day, you can then recognize the wonderful delicacy, completeness, and fitness of the human body that contains within it all the elements of the complicated structures that make up the wonderful telephone and telegraph systems—that contains such perfectly adjusted structures that are designed to function together in complete unison and harmony. The wonder and the perfection of the human nerve system become all the more amazing as we think of and see its compactness and yet its accuracy of operations, even though comprehended within the few cubic feet of the human body, whereas the telephones and telegraphs have the world for their home and use.

The skeleton, then, is a framework that supports and protects a complete factory, mill, warehouse, business office, and home. Every cell, every tissue, every organ has some specific work to do, according to its structure, character, or position in the body. At the

same time, we have already seen that each element works not only for itself but must work in coöperation with other tissues, cells, and organs, either near-by or distant. Each cell and organ of the body may be compared to man himself who, as a complete unit and as a citizen of the living world, must take his place and live and exist not only for himself but in coöperation with other men, either in a local community or a larger group as in a city, state, or nation. He sees, he hears, he feels, he thinks in the main as others do, and he must respond properly, justly, accurately, and rationally, according to *community* requirements—and not merely to gratify personal desires.

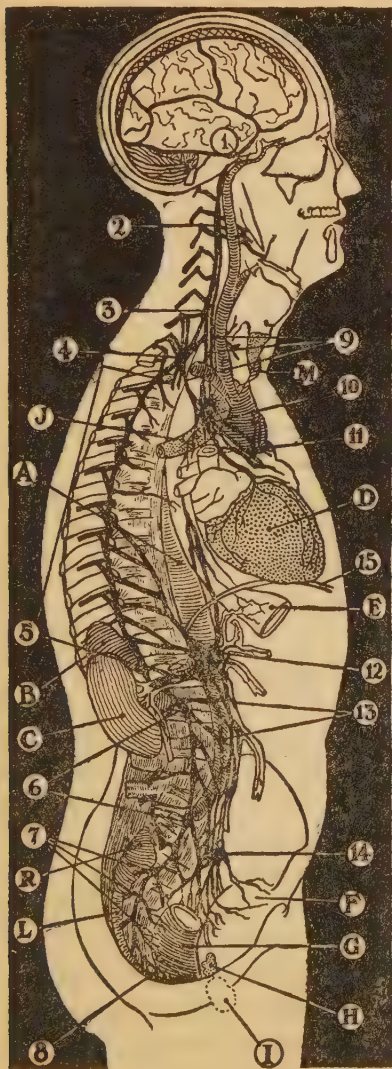
Just as we have analyzed the details that make up the arc of a telephone or telegraph operation, so we will analyze the nerve circuit. For illustration, suppose your hand is hit by a thrown ball, or your hand comes in contact with hot water, or a few drops of alcohol are spilt on it, or an electric current is applied to it. The skin is disturbed in any one of the four cases—each of which is called a stimulus; the first, a mechanical stimulus; the second, a thermic stimulus; the third, a chemical stimulus; and the fourth, an electrical stimulus. Underneath the skin the very fine nerve-fibres are excited and carry this disturbance to a sensory nerve-cell in the spinal cord. The relay is carried over an ascending nerve-fibre up through the spinal cord to the brain. Here a sensory nerve-cell is disturbed by the excitation, and relays the agitation to a brain motor nerve-cell that is in charge of the muscles of the hand excited. This motor nerve-cell sends its excitation down a descending fibre through the spinal cord,

to the level where there is a spinal motor nerve-cell in direct charge of the specific muscles. This spinal motor cell relays this conduction out of the spinal cord into the skeletal muscles of the hand. The muscles are excited and contract and pull away the hand from the original cause or source of stimulation. Herein we see all the elements that are employed in the ordinary movements of the skeleton, which include both motion and locomotion—walking.

Both the telephone and telegraph systems have installed more and better mechanical devices which permit of multiplex telephoning and telegraphing, in other words the sending of a number of messages over the same wire. Lately they have been introducing the automatic exchanges and stations, which will eliminate the central office operators and permit of connections more directly. The nerve system has always had a similar automatic system, which enables the human being to perform many acts without communication with the brain. This includes both the autonomic nerve system, described in the previous chapter, and the reflex action.

The nerve direction or control of the process of digestion already mentioned is an example of the activity of the autonomic system. So is the process of respiration, which consists of the taking of air through the nose, throat, and wind-pipe into the lungs, and the elimination of carbon dioxide in the reverse way from the lungs. Then we have a number of instinctive actions which we may say are the results of inheritance. These cover the acts of crying of the infant, pulling his toe away when scratched, and numerous others. These

PHYSIOLOGY OF THE NERVE SYSTEM



The nerve system in relation to the body organs:

1. Carotid Plexus.
2. Superior Cervical Ganglion.
3. Middle Cervical Ganglion.
4. Inferior Cervical Ganglion.
5. Twelve Thoracic Ganglia.
6. Lumbar Ganglia.
7. Sacral Ganglia.
8. Ganglion Impar.
9. Cardiac Branches.
10. Deep Cardiac Plexus.
11. Superficial Cardiac Plexus.
12. Solar Plexus.
13. Aortic Plexus.
14. Hypogastric Plexus.
15. Diaphragm.
- A. Aorta.
- B. Suprarenal Gland.
- C. Kidney.
- D. Heart.
- E. Esophagus.
- F. Bladder.
- G. Rectum.
- H. Seminal Vesicles.
- I. Location of Prostate.

acts are explained by the law of racial inheritance; they were done by the infant's ancestors for many generations, yes, many centuries. The parents did not transmit the power itself, but the tendency to use such a power or to do such an act when the stimulus is the same has been inherent in all of us for ages and ages.

Lastly, we come to the purely reflex actions or habits. Day after day, week after week, the nerve cells of the spinal cord receive the same or similar stimuli and answer or respond to them in the same way. A time then comes when a stimulus is repeated and the spinal sensory cell, instead of transmitting its impulse up to the brain, arouses the spinal motor cell to contract the muscles without the intervention of the brain motor cell; it answers as an automatic central station, without the need of an operator (the brain). Here is the basis of habits and the conduct of life. What a great economy does this power of reflex action give to us!

Practically ninety per cent or more of everything we do, every motion we make every day is merely a repetition of the work done the day before. A little thought on this subject will enable one to recognize the fact that if every solitary act, every solitary movement of the body required the direct intervention of the brain, there would be scarcely any time left but for the ordinary daily routine of muscular movements. One would then have absolutely no time to devote to the cultural, social, esthetic, and educational sides of life. There would be no time to delight in the pleasures of books, no time to enjoy a painting, no time to relax, and no time to develop the higher senses of your life.

The strain placed upon the nerve system—the higher side, the brain—would be too great.

The facts in the case are vastly different. All these routines, all these thousand and one actions of daily life are performed automatically, and the mind is free for the higher senses and functions. And the development of this automatic action takes place, for the most part, in very early life. Certain movements and combinations of movements are learned early, so that in later years when some entirely new action is required we find our nerves and muscles responding very readily to the demands; and if this new action must become automatic it becomes so with remarkable ease and speed. It has been claimed that the greater the coördination of muscles and the greater the ease of developing automatic action of the muscles, the greater the capacity of the brain for concentrated effort and productive work and the greater its ability to master new details; and the reverse also in time—the greater the alertness and capability of the brain and mental faculties the more responsive are the nerves controlling the muscles.

Let us now turn to the skin, which forms a covering for the entire body. Underneath the skin and mucous membrane and in the delicate sense organs are millions and millions of the finest hair-like nerve endings, which carry and transmit the excitations as already shown. So highly sensitive are these nerve terminals that the faintest movements of the air, the feeblest vibrations of light, the most delicate sounds, the vaguest of odors, and the most delicate touch of the finger, or the slightest change in temperature—either cold or hot—will almost

instantaneously produce an effect upon these minute fibres. The stimulation will then be transmitted to the proper centres in spinal cord and brain, and thereby produce the proper response to the irritation.

This leads then to the real use of the brain. We have seen that more than ninety per cent of the actions of our daily lives do not employ the brain. Hence the brain is available for unlimited development of cultural faculties. But modern man has not yet fully utilized the brain capacity. The problem as will be shown in later chapters is the proper exercise and training of the nerve system in general for better autonomic action and for better health, and a better use and more intensive development of the brain.

The neuron (the complete nerve cell), which is the basic unit of the nerve system, will never wear out by regular, systematic use. But once the cell body is dead nothing can be done to restore that neuron or any of its processes to functional activity. Here is the foundation of the principles of re-education, to be explained later: so long as the cell body is alive, the neuron can always be made serviceable. If either process—the dendrites or the axons—is in any way injured, cut, torn, or lacerated there is always hope of restoring its integrity and vitality so long as the cell body is intact.

CHAPTER III

General Causes of Nerve Disorders

YOU have learned that man is largely a bundle of nerves. You have observed that he is so highly sensitive that he is responsive to every stimulus or excitation or disturbance from within and from without. You recall that man's body is the home of the most complete telegraph and telephone systems. Every wind that blows irritates the skin and carries waves through the telephone wires—the nerve fibres—to the central office, to be relayed to the proper station for proper action. Every heat wave arouses the skin to notify the heat centres in the brain of a change in the temperature of the external world. Every sound that vibrates through the air is carried to the ear and transmitted to the auditory centre in the brain. And so on, through the innumerable stimuli that may reach the nerves of all portions of the body.

Then think of the average man and woman living in this active, rushing, racing, noisy world. It is not at all surprising that one so frequently hears the expression, "I'm nervous." What is really astonishing is the fact that the whole world has not gone *mad*!

Before going into an account of the various causes responsible for the deplorable condition of weak, unstable, and shattered nerves, which practically every man, woman, and child faces, I beg to fore-announce that we shall find ways and means of overcoming these nerve-weakening factors. While the conditions are

not altogether desirable, most of us have survived the most serious consequences and we shall, in all likelihood, gradually develop a resistance to these inherently enervating and debilitating influences.

Among the various causes of nerve irritation engendered by modern life in general we find many that are not usually considered in this light. Among many we find conspicuous the rushing, noisy, kaleidoscopic nightmare of existence in a large city; the overwork in the sweatshop; the ennui of the idle rich; the mad pursuit of pleasure, wealth, and power; the use of alcohol, tobacco, tea, coffee, and other drugs; the monotony and wearisome toil of the daily grind on a lonely farm; criticism of and gossip about our affairs by unfeeling neighbors, relatives, or friends; discontent with things as they are—to mention but a few. Anything which disturbs the normal balance of work and play, exercise and relaxation or sleep, and the cultivation of body, mind, and spirit, will tend to produce some disorder of the nerves, particularly when coupled with improper diet, shallow breathing, and lack of exercise and sleep.

Dietary mistakes such as overeating in any form, the use of denatured, super-refined, and predigested foods, lack of mastication, poorly balanced meals, and insufficient water-drinking may affect the nerves by producing toxins in the system, by depriving them of necessary elements for their nourishment and chemical response, or by overworking them. Faulty diet is, in fact, one of the most important causes of nerve disorders.

Shallow breathing deprives the body of oxygen and

depresses the nerves because of the accumulation of carbon dioxide. It also decreases the production of nerve energy because of the interference with general metabolism. The lungs are the bellows that create the draft for the fires of life and unless they are working fully and strongly there will be only a dull glow instead of a bright flame. Not only by these means may shallow breathing lower nerve tone, but also by depriving the nervous system of the normal and natural stimulation through the effect of conspicuous rib elevation upon the spine.

Exercise is necessary to normal nerve action not only because it favors deep breathing but also because it uses the nerves and so develops them the same as use develops the muscles. It also improves circulation, upon which the nutrition of the nerves depends, and it promotes elimination so that there will be no great accumulation of poisons to deaden or irritate the nerves. It likewise helps to induce sound sleep and this is of supreme importance. Thus insufficient exercise deprives one of all these influences for health.

Lack of sleep will affect the nerves more quickly and to a more marked extent than almost anything else. During our waking hours the nerves are in constant use, and while they still function to some extent during sleep they are at least relieved of the thousand and one sensations, stimulations, and irritations that bombard them during the conscious hours. It is during sleep that the nervous energy we have spent during the day is renewed, and unless this is done properly we will have to call on our reserve energy to get through the following day. If this is done very often

the reserves will soon be exhausted and we will be in line for nerve bankruptcy—prostration. Whatever else you do, if you wish sound nerves be sure that you secure an abundance of sleep—and at proper hours designed by Nature for sleep.

The general causes so far mentioned that may tend to produce any disturbance of the nervous system are derived from the external world, that is, the environment. For that reason they affect almost every person, though to varying degrees, and their correction presents a comparatively simple problem. However, the nerve apparatus is also susceptible to conditions within the individual, such as thoughts, psychic influences, and hereditary tendencies.

Wrong thinking is a very prolific cause of nervous and mental diseases. No one can persistently think destructive thoughts without sooner or later wrecking mind or body or both. Fear is the basis of all wrong thinking but some of its variations are worry, anger, envy, jealousy, bitterness, and despondency. You cannot wish anyone ill without experiencing ill effects yourself. Worry is a very useless but a very common waste of time. It depresses the nerves, slows up all the functions of the body, and distorts the mental outlook. It never helped anyone nor prevented the occurrence of the thing worried about. We worry most about the things that never happen. Self-pity is another infamous destroyer of nerve poise. The person who pities himself is very nearly incurable, so the prudent man will avoid this selfish, useless, and destructive mental aberration. It is worth while occasionally to review one's habits of thinking and bend every effort

to keep them on the straight paths of hope, courage, confidence, tolerance, and trust in the essential goodness of things and of human nature.

In considering inheritance as an important factor or causative agent of nerve disorders, it must be thoroughly understood that the infant does not inherit a nervous disease as such. What is really inherited is a *tendency* to an instability of the nervous system. An alcoholic parent will transmit to the offspring a liability to an alcoholic craving, yet by placing the child in a proper environment the morbid tendency can be corrected and mastered. So as we consider a number of conditions of weak or disordered nerves, wherein the weakness or the deficiency of the parents may tend to affect the next generation, we find that proper education and training and better sex knowledge will gradually bring about more eugenic marriages and thus eliminate the parents as a negative or harmful influence on offspring.

The purely psychic force is now being thoroughly investigated and a mine of information is still being gathered concerning this motive or phase of the individual. Much has been written and much has been said concerning the nature and the unity of this force, and as yet there is much disagreement. It is known under a variety of names: the Freudian school calls it "libido;" others term it "instincts;" still others, "élan vital," and "drives." Human conduct and behavior may be influenced by different "driving" forces. Once it is sexual instinct, the desire for race preservation; at another time it is religious observance; again, it may be social betterment; and so on.

In fine, these mental urgings explain the religious exaltations among the Indians; or the fanaticism of the censors; or the mob attack on the defenseless prisoner. Here it may give rise to a single error or to a continuous attitude for or against a certain state or condition, without necessarily affecting the mentality of the individual or the group. On the other hand, we find an ever-growing list of those who, acting under the influence of these mental "drives," are led to emotional perturbances and psychoses. In these, the types of mental activity or process are known as *dissociations*, *complexes*, *conflicts*, and *repressions*. All these mechanisms of mental action show the existence and the influence of a subconscious mind.

Some consider that the subconscious mind is but another name for the memory. It contains the records of all the conscious experiences of the individual and the more important experiences of his ancestors. It also contains the models for the building, repairing, and perpetuating of the body. If there are any faulty models, unsound or vicious or wrong ideas, or any destructive urges in the subconscious mind the best thing to do is to get them out by allowing them to come out where they can be seen and recognized, and then thrown away. If an attempt is made to suppress them they will only remain in the subconscious mind to become a constant source of subconscious irritation. No matter how unpleasant they are, bring them to the fore—and then get rid of them. Then see that all thoughts and acts are directly constructive and conducive to health and the subconscious mind will then be a great help instead of a hindrance.

In summarizing the general causes of nerve disorders we find that they may come from without or from within. Those coming from without include the disturbing influences of modern life, improper diet, shallow breathing, lack of sufficient exercise and sleep, or any other wrong habit of living. Those coming from within include wrong thinking, weak, unsound, and otherwise bad inherited tendencies, and disturbing psychic influences.

CHAPTER IV

Neurasthenia

IF it were possible to say that there exists an American disease, then "neurasthenia" would merit that title, but it is difficult to classify it as a disease entity. Neurasthenia is one of those loose terms, used not only by the public but even by the medical profession to cover a multitude of nervous instabilities, in the same sense as one says, "I have stomach trouble," or "I have rheumatism." Strictly speaking a neurasthenic person is one who is suffering from nervous exhaustion or prostration. He has expended more nerve energy than his body has been enabled to replace. It is then a functional nervous disorder. The victim is very irritable, restless, and unable to attend successfully to his daily labors, recreations, and pleasures.

Causes. To analyze the numerous conditions any one or more of which may lead to neurasthenia may give us a better understanding of the disorder and of the submerged class of neurasthenic men and women. If these causative factors are known many readers will be able to recognize them and by making use of this knowledge can avoid the disease or escape from further attacks of it. Here it must be emphasized that prevention is within the reach of almost all.

A leading causative agency is that of inheritance. As stated in the previous chapter, disease itself is never inherited, but a *tendency* to disease is. Whenever the mother or the father or perhaps both are high-strung,

excitable, and generally nervous, we may find that the children have a neuropathic constitution. Their nerve system is more delicately sensitive and more easily perturbed. They become easy subjects for nervous breakdowns.

Another frequent cause is excessive study by the neurotic individual. Many over-ambitious students of high schools and colleges place upon themselves extra mental work and study in their desire to stand high in their classes, to make up conditions, or to save a term. Normal and rational study with rest, relaxation, and exercise will never in itself produce a nervous condition, but this forcing the mind—"burning the candle at both ends"—is bound to produce mental fatigue and the student becomes an easy victim of neurasthenia. Neurasthenia affects women more than men. It is found more in the crowded cities than in the open country. Wives of disgruntled, discontented, or perhaps dissipated husbands, rearing large families in the close quarters of the tenement houses of the cities, are victims. In contrast, the social indulgences of the rich young women in "high society" make them break down with nervous exhaustion from their excesses.

Frights and shocks due to being in or witnessing accidents, as railroad collisions or automobile accidents, are typical examples of potent causes of neurasthenic attacks. These are common enough that the terms "railway brain" and "railway spine" have been applied to them, whether due to a railroad accident or one of some other nature. In a few cases, severe injuries will not only affect a specific part of the body but may also affect the nerve system and produce exhaustion. In

addition, eyestrain, due either to defects in refraction or to weakness of the muscles attached to the eyeball, may tend to develop neurasthenia. The same is true, probably, of very severe attacks of stomach or intestinal disturbances, and, in cases of women, some of the disturbances of the organs of reproduction have the same effect.

Then come the poisons discharged into the system from decaying teeth or bad tonsils, also from a polluted intestinal tract, which react on the nerve system and tend to cause the same results. Likewise any deficiency in the glands of internal secretion, as the thyroid and suprarenal, may cause neurasthenic symptoms. The use of alcohol and the narcotics, pernicious habits in themselves, lead their users to come under the sway of a demoralized nerve system and therefore to become victims of neurasthenia. The same happens to those who abuse their sexual organs.

Other wrong habits of living which may lead to neurasthenia are the common neglect of diet, exercise, health bathing, fresh air, relaxation, and sleep. The use of tea and coffee, the excessive use of meat, the lack of raw foods such as fresh fruits and green vegetables, and the use of smoked, pickled, and refined foods are common errors of diet. Few people take sufficient exercise for the amount of food they consume, unless their work compels it, and fresh air is better known for its absence than for its presence. Sleep is all too often neglected for pleasure or work. Voluntary relaxation for relaxation itself is a lost art in these days of competition and of scramble for the extra dollar and the pleasure or luxury that it will buy. The excessive

expenditure of nerve energy and the almost constant drawing upon the reserve supply are the predominating causes of neurasthenia, and are present in every case, regardless of what other causes may exist. For it must be remembered that an expenditure well within the limits of health in one case would draw heavily upon the reserve in another case. It does not matter how little the expenditure may be, if it dispenses more nerve energy than is being replaced by proper nutrition, relaxation, and sleep it is excessive and dangerous to the health and nerve stability.

Symptoms. The usual earliest indication is an annoying insomnia. One cannot fall asleep, or one sleeps badly, frequently awakening and being constantly disturbed by distressing dreams, and in the morning observing no refreshing effects of the sleep. If there is desire to work or play or study, one tires very quickly and needs to have periods of rest and quiet. Almost persistent headache is common, particularly at the top and back of the head, or, more frequently, there is a "band" about the head. The head "bands" are an important feature in many cases. Many neurasthenics describe the feeling as being similar to that produced by an elastic band about the head. It is not uncommon to observe these people quite frequently lifting their hats or passing their hands over the forehead and probably about the head—the hat *seems* too tight, though it may fit perfectly. Others have a burning sensation, very frequently within the skull and usually at the top of the head. Many times the unpleasant sensation is in the form of a square, a circle, a point, a line, or some

other kind of a geometrical figure. Very often, especially in women, there is pain in the back of the neck and along the spine. Walking is sometimes difficult because of the apparent muscular weakness which is, in reality, mainly a nerve weakness.

Many patients complain of eye troubles. They see poorly; the pupils frequently will be found to be dilated. Then there may be noises in the ear, but they may be due to some disease of the middle ear, and not to neurasthenia. What is more common is the excessive sensibility to sounds. Some are irritated by the least sound, even though it is pleasant to others. Similarly a morbid or unpleasant response to taste and smell may be present.

Many neurasthenic sufferers have some functional disturbance of the heart. Any slight cause will produce an increase in the rate of the pulse. In most cases general heart weakness is observed, though there is not necessarily, nor very frequently, a diseased heart. In older cases, there may be a low blood pressure, the circulation of the blood being very slow and sluggish. Associated with this may be cold hands and feet, and reaction to the cold air of the atmosphere or to the cold bath. Then great change in the weight often occurs; some may gain, others may lose ten to twenty pounds in a few months.

Nearly every victim of neurasthenia has a nerve system whose power for normal activity is far below the average. The energy of nerve-cells of the brain and the spinal cord expends too easily and builds up too slowly.

ACUTE NEURASTHENIA

There is such a condition as acute neurasthenia. This follows prolonged excesses, either alcoholic drinking, or sexual acts, or even too strenuous mental strains with loss of sleep. In these cases, the sufferer may have all the signs of neurasthenia and yet fully recover in two or three weeks.

CHRONIC NEURASTHENIA

Neurasthenia is much more frequently a chronic disorder, coming on gradually and developing in a few months. In shocks, however, it comes on suddenly, where the body is already below normal. In these cases it reaches its greatest intensity in a very short time. Any case may last for from one or two years to seven or eight years unless properly treated. Both men and women patients who lead very careful lives are able to recover their nerve balance, the numerous symptoms greatly reduce and, in time, disappear, and the afflicted ones may live long, useful lives.

Treatment. The leading factor for correction in severe cases is rest. A regular "rest cure" is required for many cases! One should stay in bed for several days; then for a week or two sit up, part of the day. By the third week, in the usual case, a short series of physical exercises may be taken daily. Massage at home should be included, then later at the gymnasium or other more satisfactory place if it is considered still to be necessary. In all cases, plenty of rest and sleep

are necessary even though the complete "rest cure" may not be. In cases of business men it is advisable that they divide the day, devoting only half a day to business and half a day to rest and sleep, and later to mild recreation and physical activity.

The exercises undertaken should not be too strenuous and should be adjusted to the constitution and taste of the patient. The exercise habit is developed not only to strengthen the muscles, to help the circulation, and to increase the activity of the skin, but also to arouse interest in something other than self and to give one some physical pleasure. Horseback riding is an efficient form of exercise and may be enjoyed by those who have the opportunity; walking may be more satisfactory for others. Golf can often be recommended, as can tramping (cross-country walking), hunting, fishing, auto-camping, etc. Later, calisthenics, swimming, and sports may be adopted.

The need for change of scenery is often brought up, and must be carefully considered. Change of scenery is usually beneficial to neurasthenics, but it is best to go to a specified place and stay a few weeks, as the traveling itself is not infrequently injurious. A fairly high altitude, as in the mountains, will benefit one more than at the seashore. A change of scene is not a vital necessity, however, as one may remain at home, wherever that may be, and secure full relief if the remainder of the treatment—physical and mental—is favorable.

Stopping at a sanitarium, of which there are many over the country that can be highly recommended and are well supplied with all the modern appliances for treatment, may be worth while. One caution, however:

do not stay for more than from four to six weeks at a time, unless the treatment includes mental hygiene. The ordinary neurasthenic is easily affected by the constant sight of invalids, and becomes a prey to a number of imaginary physical ills unless he is particularly trained otherwise. In the summer, camping in the woods or living a partly outdoor life is very helpful.

The diet best adapted to most cases is the milk diet. It supplies adequate nourishment in an easily digestible form and also aids in producing general relaxation. It combines well with the rest treatment if this is used.

If the milk diet is not employed a normal diet of fruits, vegetables, whole-grain cereals, and dairy products may be followed. Raw foods are important as they supply vitamins. Fresh fruits are helpful here as they are so agreeable to the taste. Meat is not used as a rule, but certain cases which seem to require stimulation may be benefited by using it moderately for a time. Tea and coffee should not be depended upon for stimulation, and in fact the stimulation from them will be positively injurious in most cases. Overeating must be avoided.

A few days on nothing but fresh fruit is advisable at the start of the treatment, especially where there are normal or excess weight and an appreciable degree of toxemia; and the fruit diet may be repeated whenever the appetite fails or when there seems to be a need for rest of the digestive apparatus, or for extra elimination. Tobacco should be entirely avoided in all cases of neurasthenia or in any other case of "nerves."

Hydrotherapy is a very valuable aid as a curative agency. An excellent bath is a cool sponge bath while

standing in four or five inches of warm water. This should be taken every morning, and the bath temperature lowered every few days until the fully cold bath can be taken with a prompt reaction to warmth. There is no tonic for the nerves that can surpass the properly given cold bath. If convenient, a cold douche on the spine or a Scottish douche would be very beneficial. The latter is a rain douche at 106 degrees for one minute, followed by a general fan spray and percussion douche to the spine and legs at 60 degrees for twenty to thirty seconds. This may be taken every second day. For women, hot compresses with massage are sometimes helpful. At night, a full tub bath at 98 degrees to 100 degrees, for from ten minutes to an hour, often relieves sleeplessness. Massage is usually more helpful to women than to men, but it should be employed for both sexes when there is need for prolonged rest.

Spinal treatment may be of considerable assistance because of the mild nerve stimulation it gives, though sometimes there is a specific spinal abnormality, as contracted muscles and ligaments which interfere with normal transference of nerve stimuli to the various organs of the body or which cause a constant expenditure of nervous energy through nerve irritation, and proper spinal treatment may correct this.

Sun baths are very helpful, because they soothe and tone up the nerves and have a very pronounced influence upon metabolism, aiding in the assimilation of some of the food elements highly important in organic activity and nerve stability. They may be taken daily whenever the weather permits, but should start with only a few minutes' application at first and be in-

creased gradually so as to avoid burning and enervation.

The mental attitude is important. One should strive to be hopeful, happy, and determined to get well. Never allow the attention to centre on thoughts of fear, worry, and disease. Suggestion by a practitioner may be advisable at first, as most neurasthenics have comparatively little will power with which to control the thoughts.

Internal secretion treatment is very helpful in many cases of neurasthenia, especially those following influenza, grip, typhoid, and other weakening diseases. But this rapidly recuperative measure must be secured through a physician.

Inasmuch as neurasthenia is a functional disorder and not due to a structural change in the nervous system it is curable, if one will adopt a rigid rest and dietetic regimen and assist with a cheerful mental attitude.

CHAPTER V

Hysteria

HYSTERIA is one of the most frequent of mental disorders, and plays a very great part in the history of mental abnormalities. It is widely prevalent in some degree among young women; children may be affected; boys sometimes have it, but men rarely do. The many leading neurologists and psychoanalysts have described and defined hysteria from various angles. To define it in the simplest terms, hysteria is a psychoneurosis or a functional disturbance of the mind and nerve system brought about largely by mental conditions, due to factors which lie in the subconscious mind. Möbius defines it as "a state in which ideas control the body and produce morbid changes in its functions. There are disorders of the will, perversions of conscious inhibitions, and lessened or increased action of some of the brain functions. Hysteria is not, strictly speaking, a specific disease but a peculiar state of mind, although it usually occurs in conjunction with an unstable nerve system—inherited to some extent but largely acquired. No change in the anatomical structure of the nerve system has been discovered in cases of hysteria, and no sign of degeneration or decay of any part of the nerve system is detectable. Originally hysteria was thought to be due to a disorder of the uterus, hence the name, which is derived from the Greek word *hystera*, meaning womb.

Causes. Heredity plays an important rôle as a

predisposing cause of hysteria. Parents who are neurotic or who have a particular nervous disease such as epilepsy, or who are addicted to alcohol or drugs, will usually have children whose minds and nerves are easily upset and who therefore are liable to develop hysteria.

Then improper training or lack of training to overcome the inherited predisposition will still further favor the development of hysteria or some other neurosis. A spoiled child will be more likely to have hysteria than one who has been wisely controlled. Overfeeding, piecemealing on devitalized foods, and the use of tea, coffee, and condiments, together with lack of fresh air, sleep, and general hygiene, are associate causes. In adults the last-named causes are practically always present. Other causes may be injury, alcoholism, continual drug medication, toxemia, severe acute or chronic diseases attended by exhaustion, wasting, and pain, the stress of social obligations, or emotional and moral shock. Sometimes the condition develops as a result of long-continued repression of emotions, desires, and impulses.

Hysteria is often brought on by emotional stress, such as anxiety, excitement, grief, and particularly fear. There is a transfer from a repressed past to a physical disturbance and a bodily reaction to what the individual cannot understand or master. Many are highly imitative and therefore subject to suggestion. For this latter reason a great authority calls it "pithiatism," that is, curable by suggestion. This form is further illustrated by the type of war hysteria frequently met with during the recent World War. It seemed to be

mainly a subconscious eagerness to take oneself away from the front.

Symptoms of Hysteria Minor. In reviewing all the signs of hysteria in different individuals we find that they are divided into two classes—hysteria minor and hysteria major.

In almost all cases the sufferers of hysteria minor are girls or young women. They are highly sensitive, very irritable from the least cause, and easily offended. They are so emotionally unbalanced that they laugh and cry very easily and cannot restrain themselves. Frequently a subject when excited will complain of feeling a sensation as of a ball rising in the throat or a fulness in the throat or a choking sensation. This symptom is called "globus hystericus." The hysteria victim will often be a prey to sleeplessness, and frequently suffers spinal pains and headaches at the top of the head.

The joints may be the location of very distressing pains, and many of the best surgeons have been led to believe that the purely symptomatic condition (free from any inflammation whatever) was a true arthritis because of the pain and the swelling of the joint and the extreme sensitiveness to touch.

All manner of paralyses are simulated, when no true paralysis exists. Some of the sudden cures of paralysis have been cases of these simulated paralyses of longer or shorter duration—the patient's conscious and subconscious mind were reached by some suggestion or shock and the mental reaction brought about the "cure." Distressing dreams are common and there may be walking during sleep (somnambulism). Quite often large

quantities of light-colored urine will be passed after a hysterical crisis.

These crises usually consist merely of a spell of uncontrollable laughing or crying or both, but there may be convulsions also, as described under hysteria major. Sometimes clownish actions are performed or passionate and dramatic attitudes may be assumed and held for long periods of time.

Symptoms of Hysteria Major. The early indications of hysteria major are similar to those in hysteria minor—the laughing and crying spells, an inability to concentrate and a craving for sympathy. These are then followed by a series of mental and physical disturbances, including either loss of sensation or extreme sensitiveness of feeling, and also acuteness of the special senses of hearing and smell. There is frequently a partial or complete loss of color vision—color blindness. In addition, between attacks the patient may suffer temporary paralysis, or peculiar contractures. This latter condition is a very important sign; at the least cause, perhaps a slight pressure or a slight blow, either the hands or feet will become rigidly contracted. As a rule these contractures are temporary, but in a few cases have become permanent; but if the patient can be reached subconsciously by proper suggestion practically every contracture can be corrected.

The mental symptoms vary in different cases but there is always too much “I”—the patient thinks and talks almost entirely of herself, and her demeanor is one inclined to attract attention to herself. The mood changes from time to time without any apparent reason. The sufferers demand constant sympathy and

attention and are provoked at the least inattention; they can think of nothing else but their own personal feelings and wants. The will is weak and therefore they have no self-control, though if they "get their head set" on some certain thing their display of stubbornness leads themselves and some members of the family to believe that there is a very powerful will. The thoughts are usually tangled and on small and unimportant things, and the reason and judgment are decidedly on a bias.

Along with the mental unbalance or obliquity there may be a number of associated bodily complaints. Because of this a number of cases have quickly recovered when proper attention was paid to the bodily health, indicating a possibility of a reflex mental disturbance produced by physical weakness. Among the physical complaints are constipation, dyspepsia, lack of appetite, and vomiting. The face is often flushed, the extremities are cold, and the hands may have a temperature several degrees below normal. Sometimes there is a violent hiccough or sneezing spell. Menstrual irregularities are the rule in hysterical girls and women.

The convulsions that are often noted may be either one of two marked forms or types. One is the ordinary form of hysterical convulsion; the other is far more marked and severe, and is known as an hysterio-epileptic attack or seizure. In the ordinary form, which may overtake a minor-epilepsy patient also, the subject may fall suddenly and various irregular movements of the arms and legs occur. But regardless of how severe these attacks are, the patient does not completely lose consciousness and is careful not to injure herself. If she falls she is careful to choose a safe place for her

decline. Very frequently if she observes that she is attracting no attention or exciting no sympathy she will gradually or quickly come out of her attack, though sometimes the attacks are still more severe. In the more serious form the arms, hands, and fingers are flexed and the legs and feet extended. Meanwhile there may be groaning, crying and screaming, and even biting of the lips. The eyes are generally closed and the eyeballs move around irregularly or are rolled upward and held stationary. Sometimes the patient falls and lies unconscious, usually with steady contractures for a while then alternate contraction and relaxation. These may involve the entire body or one or more extremities. Following this there may be a stage of emotional attitudes, in which the patient holds dramatic postures expressive of anger, joy, surprise, disgust, or some other intense emotion. Frequently the last stage is one of delirium, but this is of short duration. This type of convulsion must not be confused with that of epilepsy, though there are some features of it that very closely simulate this disorder.

Many cases have what are called "hysterogenetic areas" (or points or zones), which are various areas of the skin, pressure upon any one of which starts an attack of major or convulsive hysteria.

Treatment. It has been too frequently assumed, even by many medical men, that a hysterical person is not ill, but is malingering. Many assume that because there is no discoverable defect in the nervous system or in any of the vital organs there is no real disease. But the victim of hysteria is in reality a sick person, and should be considered and treated as such. The

average physician dislikes to take charge of a neurosis or functional nervous disease, because he is unable to benefit such a case. His treatment being designed to affect the physical body, and his training being for the treatment of physical conditions, he is at sea when confronted with disorders of the mind or a functional disorder of the nerves.

Sir William Osler said in his *Textbook of Medicine*, "To treat hysteria as a physical disorder is, after all, radically wrong. It is essentially a mental and emotional anomaly [irregularity], and the important element in the treatment is moral control. At home, surrounded by loving relatives who misinterpret entirely the symptoms and have no appreciation of the nature of the disease, the severer forms of hysteria can rarely be cured. The necessary control is impossible. . . . The treatment consists of isolation, rest, diet, massage, and electricity. Separation from friends and sympathetic relatives must be absolute, and can rarely, if ever, be obtained in the individual's house. . . . The remarkable results obtained by this method are universally recognized."

As the general physical condition is also usually below normal, some means should be adopted to build up the body at the same time the mind is being directly treated. Only by the combined method can the most rapid and permanent results be obtained.

In addition to the separation from family and friends, mild cases should be given some regular occupation that does not require too hard application. In other words, there should be something to interest the mind and to divert the patient from too much

introspection and thinking of self. The physical body should be brought into activity, but without risk of physical exhaustion. Even physical fatigue should be avoided during the early stages of the treatment. There should be an abundance of physical relaxation, and nine or ten hours' sleep, if possible, every night. A rest course for the mind will be absolutely necessary in many cases of major hysteria, but should be employed in well-defined cases of minor hysteria, also. Many times complete bodily rest is not so important, but it will be of much value when the nervous energy is greatly depleted. The hysteric may be required to remain constantly in bed for two, three, or four weeks, then for a week or two allowed to sit up part of the day, gradually decreasing the amount of rest during the day until interest in some business or occupation has been awakened and the need for the extra bodily rest passes away. But throughout the rest period the other health factors must be employed.

The mechanical aids for treatment include baths, massage, and exercise. The water cure is probably the most efficacious, next to isolation and rest. The full tub or immersion bath should be employed at a temperature of 95 degrees to 97 degrees, duration from fifteen minutes to an hour or more. This is a sovereign remedy, and will usually avert a threatened attack if perseveringly employed. It will also bring about such an improvement in physiological processes that the tendency to the attacks will become gradually less pronounced.

Hot and cold applications to the spine may relieve pains in the back, and calm the irritable nervous

system. The douche or jet to the back is also of some service, but should be reserved for later treatment.

Massage helps to promote nutrition, is soothing to the nervous system in many cases, and may correct muscular contractions more or less permanent or of long standing.

Any exercise of reasonable activity, but not too severe, should be helpful and should be more frequently recommended than has been the case in the past. However, in the more severe cases of hysteria it will be well to avoid any special exercises until there has been considerable improvement. In the milder cases any simple exercise system may be adopted. Except for those cases that have become almost helpless, gradually lengthening walks are very good, but these should be taken over different routes so as to keep up the interest and avoid monotony, with consequent return of introspection.

While electricity is usually unavailable in a home, there are some forms of this treatment that are of considerable value. The general use of either the faradic or static current has some beneficial tonic effect, and the home outfits for giving "Violet Ray" treatments may give some appreciable relief in many cases, especially when the electrodes are applied to the full length of the spine and to the extremities. Static sparks may relieve the contractures of the fingers and toes.

When the convulsions come on it is best to avoid trying to do much for the patient. Except in the most severe forms, the patient will see to it that she is quite comfortable, but if she has neglected to do so this

should be seen to. The attacks are usually much less severe and of shorter duration if no observer is around. Quite often the convulsions or other attacks may be stopped by throwing cold or cool water in the face or about the lower line of the chest.

The diet should be carefully watched. All stimulants and irritants such as tea, coffee, condiments, smoked and pickled foods, tobacco, and alcohol should be avoided. Often the milk diet is the very best to use, but if for any reason this cannot be employed the diet should consist of plain, wholesome, and unrefined foods. Only a few articles at a meal are better than a large variety. Variety should be had from meal to meal rather than at each meal, if variety is found necessary. Overeating in any form must be avoided, particularly eating between meals and late at night.

Post-hypnotic suggestion may be helpful if the patient is a good subject for hypnotism. "A typical example runs somewhat as follows: S—— was a young lady admitted to the hospital suffering from an extreme case of hysteria. In her attacks she became violently emotional and criminal. Her habits had become filthy and she was unable to care for her own person or her own room. At the beginning of her treatment the hypnotic suggestion was made that she would sweep her room at such and such a time. After repeated suggestions the instruction was finally carried out. Other habits were gradually established, the disturbing source of her hysterical attacks removed and she was finally discharged from the hospital, a normal person. A year later she had

completed a successful term of work as a cook and maid."

Effort should be made to avoid all emotional stress, either of an exciting and stimulating nature or of a depressing type. Whatever else is done, in the way of physical treatment, there should be made an attempt to establish mental, moral, and emotional balance and stability.

In cases of children, removal from the home and placement in well-disciplined private schools will often be most advantageous for early cure. If there is any hereditary tendency to hysteria or other nerve imbalance every effort should be made from earliest infancy to avoid for the child all exciting, depressing, or otherwise disturbing conditions. Living conditions must be as simple as possible—back to more nearly the calm days of a hundred years ago. There should be no coddling, but no nagging, and school work or study should be within the strength of the growing but overactive brain; and relaxation and physical activity must be regular and systematic, though no tedious forms of exercise should be prescribed. This should be in the form of play, for any child.

CHAPTER VI

Chorea or St. Vitus's Dance and Habit Spasm

ONE of the most common of nervous disorders of childhood is St. Vitus's dance, or chorea. The distinguishing feature of this disease is the peculiarly characteristic irregular spasmodic, involuntary contraction of the muscles, with twitching movements. The term "St. Vitus's dance" was supposedly first given to a "dancing mania" of the middle ages which St. Vitus was implored to cure. Another version is that dancing before the image of St. Vitus would insure good health for the ensuing year. The dancing mania is now called "hysterical chorea," a rare condition, and "St. Vitus's dance" is now applied only to the ordinary chorea—"chorea" being derived from the Greek *choreia*, meaning a choral dance.

There are different types of chorea, the ordinary form sometimes being called Sydenham's chorea. A degree of this form that has very rapid spasms of a particularly jerky character is sometimes called electric chorea. Chorea major is a term applied to the quite violent choreic spasms occurring in major hysteria.

Causes. Chorea of the ordinary form is essentially a disease of childhood, appearing usually between the ages of five and fifteen. Girls are considerably more frequently affected than are boys.

The underlying cause may be an inherited instability

of the nerve system, or feeding and other care during infancy and early childhood that prevents normal development throughout and thus establishes a weak nerve system. In addition to these, anything which irritates the nerves or depletes the nervous energy may lead to the development of chorea. The use of candy, condiments, rich foods, white flour products and demineralized, devitalized foods, and piecemealing, also the use of tea and coffee, will either irritate, poison, or starve the nerves and make one susceptible to chorea. The lack of uncooked and unrefined foods, by depriving the nerve system of proper nourishment, particularly the vitamins, greatly hinders the production of nerve energy.

Too close application to study at the expense of outdoor play, and lack of adequate sleep are frequent causative factors. Fright, injury, worry, competition in either studies or physical activity when the nerve energy is low, and infectious fevers which have been improperly treated, may also produce chorea. Scarlet fever is perhaps the most frequent acute disease that is later followed by chorea. Rheumatism is given as a cause, also, but some medical men now hold the opinion that chorea itself is a manifestation of rheumatism, and that the nervous symptoms are the result of the rheumatic poisons irritating the nerve cells of the brain.

Symptoms. As a rule chorea develops slowly. At first the child seems merely to be a little clumsy in her movements, and there may be an occasional twitch of the muscles here and there, perhaps a facial grimace. For the latter she may be reproved or punished by parent or teacher who fails to recognize the developing

disorder, and this may further excite the child and aggravate or hasten the development of the disease. In walking there may be slipping and an occasional stumbling, apparently without reason.

Within the course of a few weeks the signs of the disorder become very marked. The child jerks her head or shoulder, twitches the arms or legs, makes many facial contortions, and may drop things from the grasp. The two sides of the body may be affected similarly, though without symmetrical movements, or one side may be much less affected than the other. The speech becomes slurred and words are badly articulated, and in the most sensitive children there may develop a condition of mutism. Some children become almost helpless, and require to be dressed and fed. Any little excitement or unusual physical exertion will arouse more pronounced movements. During sleep these choreic movements usually stop, but the sleep is apt to be disturbed, and there may be night terrors. As a rule the choreic child is bad tempered, unruly, and hard to control.

The child's appetite is generally very poor, and frequently the digestion is so impaired as to lead to emaciation and weakness. The heart action is irregular, and not infrequently there is a distinct murmur, and, in fact, valvular disease is a not uncommon complication—considered as resulting from the rheumatism or scarlet fever or other causative disease, but due, no doubt, to the toxins causing these diseases. The muscles become weak, but there is no paralysis.

Acute Chorea. The duration of an attack of chorea is usually from six to twelve weeks, though some

cases have continued for as long as six months. There may come a period of marked improvement or almost a cessation of all twitching or other signs, with a relapse after several days, weeks, or months. In other cases there may be intervals of attacks and improvement extending over years, though this is unusual. Proper treatment always shortens the duration of an attack and minimizes the possibility of recurrence.

Chronic Chorea. When the duration of the choreic movements continues on and off for more than six months the case is considered chronic. Relapses are said to occur in one-third of the cases, and more often in girls than in boys. In adults the initial attack is more likely to be chronic, but relapses are much less frequent than in children, except where pregnancy seems to have been a predisposing cause, in which case a recurring pregnancy may cause a relapse if the general health and nerve stability have not been assured. Practically all relapses are due to failure to adhere to properly regulated habits of living.

The outcome of chorea is usually good, though the proper treatment makes a favorable termination more assured, likelihood of relapses more remote, and general health more certain.

Treatment. At the very first indication of chorea, even of the mildest form, the child should be removed from school. The primary need is rest—mental, physical and emotional. It is also better that the child be isolated from other children. She should be kept quiet, preferably in bed, and away from all conditions that may excite or annoy her. In the early stages, when the first twitching movements are noticed, keep the child in

the open air as much as possible, but away from crowds and other children. The child should receive little sympathy, for its own good—for too much of it is apt to aggravate the symptoms.

Train the muscles by a series of simple calisthenic exercises, though in the more severe cases exercises should be avoided at first, and only passive movements are to be given. The calisthenic movements must be easy, consisting of bending the head in all directions; rotating and circling it; flexing and extending the arms; swinging the arms in all directions; bending and rotating the body at the waist; raising and lowering the legs; and bending the knees. All movements are to be done rather slowly, but each is carried to the fullest extent possible. If they can be done to slow music they will have a better effect. The exercise is never carried beyond the point of beginning fatigue, and only slight effort is made to have the movements done correctly. If it is insisted that certain movements should be performed "just so," the nervous strain upon the child will be so great as to materially aggravate the twitchings and the exercises will be far more detrimental than they can ever be beneficial. Walking is a helpful exercise, if taken over new routes daily.

Air and sun baths and cool-water baths should be given daily when possible, though all cases will not respond the same to these. Sometimes a neutral (98 degrees) tub bath may be given if there is too much nervous excitement or if the choreic movements are severe; but when there are very violent movements cold spinal compresses may bring more prompt and

complete relief. The compresses are best given by a towel folded lengthwise until it is about four or five inches in width; this, wrung from cold water, is applied full length of the spine and a new compress is applied every five minutes for an hour or so.

Plenty of sleep is essential and an afternoon nap, or at least an afternoon rest period, should be insisted upon. The milk and fruit diet is of great benefit in most cases, but solid food may be employed if those articles mentioned under "causes" are omitted, and if milk and fruit form a large proportion of the diet. An occasional day on nothing but fruit is of advantage if there is not a very vigorous appetite and if the weight is not too far below normal.

Even for children, suggestion is often very helpful. The best time to give it to the child is in the evening just as it is going to sleep. Be sure the child is as relaxed as possible, both for the sake of restful sleep and the suggestion. Suggest relaxation, sleep, health, and strength. (See section "Suggestion," final chapter).

HABIT SPASM OR TIC OR SPASMODIC TIC

Closely related to chorea, with its irregular, jerking movements, are tics and spasms with various coördinated quick movements of similar groups of muscles.

In children, either as an abortive or arrested chorea, or possibly as an after-effect of an old attack of chorea, there may be seen a shrug of the shoulder, a sniff, a winking of the eye, a drawing down of one corner of

the mouth, or a peculiar trick of speech. Adults, also, may develop at any time in life a similar characteristic grimace or gesture, and they may carry such through the greater part of life. Some of these movements may be very slight, while some are very pronounced and may remind one of an orator, actor, or clown.

Usually these spasms are the result of some irritation, as an eyestrain, nasal disorder, tight collar band or sleeve band or belt, the pressure of a collar button at the back or front of the neck, etc. At first the movement is voluntary, and performed for the relief it affords; but quite quickly a habit will be formed and the movement—or movements—becomes involuntary, yet, usually, is under the control of the will if conscious attention is given to it. In some cases there seems to be little or no control over the movements. During sleep such spasmodic movements almost always cease entirely.

Sometimes the decidedly local tics are more constant and more difficult of correction, as they are localized along a specific nerve of the face, eye, throat, or extremity. The predisposing cause is always a weakened nerve constitution from wrong habits of life. The exciting cause may be shock, anxiety, exposure to cold and damp, or actual injury.

There is another queer spasmodic affection, in which the spasmodic tics are associated with peculiarities of speech. Some individuals, during the spasms, may give vent to some profane or obscene words; others during the convulsive movements, may involuntarily repeat the last words of the sentence spoken to them; or spasmodically imitate a gesture made to them; cry out some

secret thought or idea; speak any thought in the mind at the time; speak with an explosive grunt, etc.

Treatment. In the simple spasms or habit spasms of adults, the primary need is to train the will. Through developing a strong nerve system and by constant attention one may be able to correct the bad habit. If these spasms in childhood be due to an abortive chorea, then what has been said in regard to treatment of chorea will hold good here. These children may be permitted to go to school, but they should be watched more carefully than others and kept for the most part away from other children lest they be laughed at and mocked and thus made much more sensitive, possibly becoming highly overstrung nervously. Plenty of outdoor and simple exercises with sufficient rest will be beneficial, and in fact necessary, for these children, as well as for those who are sufferers from the after-effects of typical chorea. But there must be no competitive exercises, and great care must be taken to prevent such children from devoting too much attention to study. Competitive class work in school will prove even more disastrous than will competitive games and other exercises.

In the more serious forms simple exercises, ample rest and recreation, massage, air and sun baths, cold baths, deep breathing, and proper diet are advisable. The same diet as given for chorea will be satisfactory in these cases. Some fasting may be necessary if there is a very toxic condition present or if there is any inflammation of the nerves.

CHAPTER VII

Neuroses: Professional and Occupational (Artisan's Cramp)

THIS term includes a group of considerable size, of disorders of nerves and muscles resulting from prolonged use or strain or frequent and repeated shock of nerves and muscles, necessary to or common in certain occupations. These neuroses are usually produced in occupations requiring intelligence and skill where a considerable concentration of attention and expenditure of energy and delicate coördination are necessary, but unskilled labor is sometimes similarly affected.

The most familiar and important of such neuroses are writer's cramp and telegrapher's cramp; but as much modern work is done under considerable tension and a great deal of work done with highly specialized and complicated machinery, many varieties of neuroses have developed within quite recent years. Among those whose occupations are liable to produce neuroses we may mention artists, artificial flower makers, button makers, carpenters and lathers, cigar makers and cigarette rollers, cobblers, drummers, electrical instrument makers, machinists, masons, milkers, pianists and violinists, pressers and ironers, tailors, sewing machine workers, stenographers and typewriters, stove and floor polishers, professional walkers, weavers, and numerous others.

Such a neurosis, in fact, may develop in any pursuit requiring repeated contraction or pressure upon muscles, repeated grasping, pushing, pulling or stretching, repeated fine muscular movements, etc.

Causes. The primary exciting cause is evidently the overuse, strain, or repeated shock of the muscles and nerves. But the majority of sufferers show also a weakened nervous constitution, probably partly inherited but largely due to general wrong habits of living, with excesses of other kinds in addition to the excessive use of the involved muscles. That the mental condition plays a great part as a predisposing cause in many cases becomes evident by the number of cases that follow great worry, and anxiety to rush or complete a large amount of work within a specified time. For example, mere copyists, such as clerks, working under a strain and, in addition, sitting improperly and holding the pen in a cramped position, are more susceptible to writer's cramp than authors who write a great deal but who stop from time to time to think or to relax and who occasionally or frequently rise from their seats for various reasons. Authors are, in fact, rarely known to suffer from writer's cramp.

As a rule these neuroses attack men more frequently than women, and those of the nervous temperament are more susceptible. The period during which one is most susceptible is between twenty and forty-five. About ninety per cent of all occupational neuroses affect the hand and arm, doubtless because the muscles here, particularly of the hand, are so highly trained that very refined and rapid movements are possible, but also because most occupations require a much greater use of

the upper extremities than of the lower. But it is by no means uncommon to find neuroses involving the facial muscles, as in players of wind instruments, or in the lower extremities from pedaling, squatting, kneeling, or from occupations causing pressure from sitting in one position for long stretches of time.

Symptoms. The symptoms of these various neuroses are more or less similar, except that the muscular tremors, spasms, or cramps, and paralysis, naturally must be present only in the particular muscles affected. As writer's cramp is the most common of the occupational neuroses the symptoms of this condition will be described.

Writer's cramp (also called scrivener's palsy and graphospasm) usually comes on rather slowly, generally the first symptom being a sense of fatigue of the muscles later to be more severely affected. Sometimes the first symptom will be a feeling of weight in these muscles, and, rarely, actual pain. One is likely to relax and shift his position more frequently than is usual for him and, blaming his pen, change the style of pen, also the style of writing. Not infrequently there will be a spasm or cramp in the thumb and finger, whenever a pen or pencil is grasped; and sometimes the writing instrument may be "flipped" some distance from the hand, or in other cases it may be held so firmly by the cramped fingers that only with extreme difficulty can it be removed. This is called the *spastic* form or stage.

A paralysis, real or in effect, may occur. Sometimes this occurs after the spastic form has existed for some time, or it may develop alone. The hand affected may

be perfectly normal for all ordinary movements and the grasp may be as vigorous as ever, and one may be able to play a musical instrument; but whenever a pen or pencil is taken in the fingers an excessive sense of weakness and fatigue causes the pen to be held weakly. As soon as the instrument is laid down the feeling passes. This is called the *paralytic* form.

In the *tremulous* form the forefinger or perhaps the entire hand is affected by a decided tremor, but this may not be present when the hand is used for other movements. Sometimes this symptom precedes an atrophy or wasting of the affected muscles, but the tremor alone does not incapacitate the hand for general use.

While there is sometimes actual pain in the muscles, which is rare, there are usually quite constant altered sensations, such as numbness or tingling. There may be a feeling of soreness, and occasionally shooting pains.

Another peculiar condition sometimes present is the dilation of the veins and a flushing of the hand when an attempt is made to write. Or occasionally the skin appears to be stretched and becomes shiny; and, again, the fingers or the entire hand may become blanched, or pale and bloodless.

The disease usually runs a chronic course and has a marked tendency to return, unless one begins the treatment early, gives the hand and arm complete rest, continues treatment long enough, and improves the general health and the stability of the nerve system. A complete cure not infrequently follows a protracted rest—not only in cases of writer's cramp but also in the other

professional neuroses. Sometimes the corresponding muscles of the opposite side of the body may be trained to do the work formerly done by the affected muscles, but these may also become similarly affected, and within a comparatively short time, if the same tension is maintained before the nervous system is greatly improved.

In the course of time the sufferer from writer's cramp becomes highly depressed and over-emotional. Usually he tries to hide his complaint from every one, but feels that all are observing his defect, possibly criticizing him. He may have attacks of insomnia, and sometimes there is headache on the side of the head.

Other Cramps. A brief mention may be made of some of the other forms of artisan's cramp. The term "musician's cramp" is applied to pianists, violinists, flutists, and clarinetists who suffer cramps in the muscles employed. Young women, in striving to win fame as professionals, become over-zealous in their application to the piano; or the method of teaching is wrong. They may suffer extreme fatigue and even pain in the hands and forearms; the pain may extend up the arms to the shoulders, attacking both sides but, usually, unequally. Violinists may suffer similar symptoms, either in the right hand from holding the bow or in the left from fingering the strings. Flute and clarinet players may have spasms of their tongues or throat muscles.

Telegraphers, particularly those who use the Morse system, have been known to suffer from telegrapher's cramp. This comes on very slowly, and the thumb and forefinger are the first to be affected. Due to the rigidity or loss of control of the muscles of the fingers

one becomes unable to make a series of dots, when the

We have, also, the group which suffers from the sewer-letters are represented by three or more dots, and makes a dash instead.

ing-spasm. This group includes tailors, dressmakers, and shoemakers.

The ballet-dancer's cramp may attack dancers. This is brought about by the local strain and is considered a form of neuralgia.

Many times nervous people will consult a physician, thinking that they have some degree of one of the professional neuroses, especially writer's cramp, when there may be no symptoms whatever of any of these disorders.

Treatment. As there are thousands who write who never have any symptoms of writer's cramp, one is rarely apt to take precautionary measures to prevent the development of this neurosis (and the same may be said of any of the other neuroses). The method of writing by the fingers alone is much more apt to cause writer's cramp than some method employing the forearm mainly. One authority suggests writing from the shoulder. The "full-arm" movement in writing is one where the shoulder becomes the pivot (the elbow resting on the table), and the pen or pencil is guided over the paper merely by forcing the elbow forward and back, and by slight motions of the biceps and triceps muscles, with the wrist held rigid and the fingers lightly grasping the writing instrument but making no fine movements for the individual letters. If such a method of writing were universally employed it is certain that there would be few, if any, cases of writer's

cramp. Since the typewriter has come into more common use there have been fewer cases of writer's cramp, though there may be a neurosis just as disturbing from the overuse of this machine. Fortunately, however, "typewriter's cramp" is as yet a rare condition.

All who must do considerable writing by hand should use the large cork or rubber penholders, and gold or quill pens, also smooth paper. Grasping a small penholder or pencil naturally necessitates greater contraction of the muscles of the hand, which tires them more quickly than will holding a larger instrument.

Nervous persons who have a habit of gripping the pen and holding it down on the paper with force must practice relaxing this grip, and more particularly train themselves to acquire mastery of their nerves. The height of the table or desk and of the chair should be adapted to the height of the writer, so there will be no strain in general posture or in the position of the writing hand and arm. The arm should rest on the elbow, not on the wrist with the elbow over the edge of the table. The paper should be about fourteen inches from the eyes (though this must vary with the vision) preferably with the light falling on it from over the left shoulder. There should be no constriction of the arm at any point from the shoulder to the wrist.

If the cramp is fully or considerably developed then the most important factor of treatment will be rest. Regardless of what other measures are employed, they will be valueless without the rest. Complete physical rest may not be necessary, and in fact a change of occupation that allows rest of the affected muscles,

especially from the small and exacting movements responsible for the disorder, may be satisfactory in many cases. But if a complete avoidance of all physical activity can be secured for a month or more, recovery will usually be more rapid and more complete. If the patient is absolutely dependent upon writing for a living, then some instrument may be used as a temporary help. There have been many devices invented for the relief of the muscles, including splints, wrist bands, and other mechanical devices to prevent spasms, relieve the fatigue, and throw the work of writing on new and larger groups of muscles. However, none of these have proven really satisfactory.

Massage and manipulation of the fingers, hand, arm, shoulder, and the controlling region of the spine have led to marked improvement, particularly in the early stages. The joints should be bent and gently twisted in all directions. General, systematic gymnastics, combined with the massage and manipulation and with general rest for the most part, will be of considerable value. The systematic practice of extension exercises and of other movements opposite to those responsible for the cramps should be a part of the patient's self-treatment.

Hot spinal packs followed by short cold applications and massage or movements similar to osteopathic movements will prove beneficial. Hot and cold douches to the spine by a hose will help tone up the spinal centres that control the muscles, and if the douche is also carried to the affected muscles the results will be hastened. The treatments may be given twice daily, but the douche should be given with no great force.

One authority recommends the galvanic electric current to the affected muscles, while at the same time these muscles are being exercised. When convenient this may be added to the treatment if the services of a physician thoroughly conversant with electrical treatments can be secured.

General constitutional treatment to remove possible internal sources of irritation, and suggestion to produce relaxation and to remove the worry and anxiety, are both necessary. Constitutional treatment includes an acid-fruit diet for a few days followed by a normal diet of solid foods, with particular emphasis on raw foods and those rich in the mineral elements and vitamins; attention to the bowels, using enemas if necessary; walking and deep breathing and regular light exercise after the initial period of complete rest; and plenty of fresh air and sleep.

The treatment of other forms of occupation neuroses than writer's cramp requires the same measures as enumerated above. The most important factors are rest, manipulation of the affected parts, constitutional treatment, and suggestion. Later, until the cure seems to be accomplished, a change of occupation should be considered, if at all possible. All operations for any of these neuroses have been abandoned by the most advanced surgeons.

CHAPTER VIII

Disturbances of Sleep

THE phenomenon of sleep has always been more or less a mystery, and many theories as to its cause have been advanced. But even to-day we do not know exactly what produces it. It is quite certain that "sleep is as much an instinct as hunger or sex," and it is disturbed only when some condition arises to keep us aware of stimuli of various kinds.

When we lose contact with the outside world, lose interest in our environment—when our consciousness has become jaded—we are in a receptive mood and physical condition for sleep—we fall asleep. Monotony is one of the most important conditions in the production of these necessary conditions; one by one various stimuli fail to act upon us, until we respond to none of them—and we lose consciousness. It might be said that these stimuli have produced a general fatigue—numerous types of fatigue. First the motor impulses diminish, the skin then becomes less sensitive, then the ear less acute to stimuli. "The sleep process is in the dominance of an organized group of rest sensations."

But there can be no attempt to discuss the many theories of cause, for they would still leave us where we began. The important thing is to appreciate the importance of a complete but natural loss of consciousness, and to understand how to bring about this state in case there is a disturbance in the natural function.

Regardless of the many theories in regard to the

cause of sleep, the *need* is considered much the same by the various authorities. We know that the infant spends practically all of its time, except for nursing periods, in sleep—or it should, if it is normal and not disturbed. Less and less time is required for sleep as the child grows older, until in adult life from seven to nine hours will be sufficient—and more than this is usually impossible in health. Sick people very frequently require more sleep, until they have been restored to health.

Idiosyncrasy governs the quantity of sleep required by individuals, some being fully restored by very few hours spent in unconsciousness. Numerous examples of such cases have been given—as Edison, with his three or four hours of sleep when on some scientific problem; Napoleon, with four or five hours; divines, lawyers, jurors, statesmen, etc., with from four to seven hours. It has been claimed, doubtless with good scientific reasons, that the most strongly intellectual persons require less sleep than those less dominating. This would seem to be the case when we consider that loss of interest or attention is necessary for sleep—which would explain the ability of mental defectives to sleep many hours: they have nothing to attract their interest, while the intellectual person has a variety of interests to occupy his mind.

For best results from sleep this should be free from interruption, usually, though habit governs to some extent. For instance, mothers of young children, nurses, physicians, and numerous others seem to secure satisfactory sleep in broken periods. Also, while night is the most satisfactory time for sleep because it is the

natural time, those who work nights are, frequently, able to secure fully as refreshing sleep during the daytime. But, especially with children, the time spent in sleep should be unbroken, and it should be mainly during those hours intended by nature for sleep. If it is desired that children be kept in the best state of health possible, there should be an observance of that old maxim—"early to bed and early to rise;" for the child especially should also secure the freshness of the early morning atmosphere.

As for position during sleep, this is largely a matter of habit. A baby or small child will sleep on any side or any portion of the body—though it may be said that if it chooses a less satisfactory position it is usually due to training received from parent or nurse. Because of pressure of the abdominal organs upon the spine, and of the overheating of the spine in summer, especially, the position on the back should be avoided as much as possible. Many people sleep refreshingly on the back, but many others have disturbing dreams in this position, some have nocturnal emissions, others have nightmares.

It is claimed by some that we choose the side to sleep on that is our most active side during waking hours. Thus, right-handed people instinctively choose the right side, left-handed people the left side. The explanation is not altogether clear, though it is thought to be an instinctive desire to lessen the voluntary movements or in some way to overcome the effects of greater activity of the side most used during the day.

Each person will have to determine for himself the position most satisfactory for bringing sleep quickly,

DISTURBANCES OF SLEEP

for refreshing sleep, and for prevention or limitation of bad dreams, snoring, and other undesirable unconscious activities during the period of sleep. The position partly on the abdomen and partly on one side or the other seems best for most people.

INSOMNIA

Insomnia is a term applied to a condition wherein a person is unable to sleep, or where sleep is disturbed by periods of wakefulness. Under ordinary conditions a man may go without sleep for but a short time without producing a serious disturbance in the nervous system. By experimentation it has been found that animals can live less than a week without sleep, whereas they can live for several weeks without food. The brain itself undergoes atrophy and the cells of the nervous system undergo degeneration when there has been long deprivation of sleep—"nature's sweet restorer;" but even in death from starvation the brain and nerve cells and nerve tissue have been the very last structures to be affected.

Regardless of the degree of intelligence, loss of sleep has a pernicious effect—perhaps more pronounced upon the more intelligent. Physical exhaustion is profound from even three days' loss of sleep, and it becomes absolutely impossible to concentrate the attention upon any subject; memory is very defective, and there may even be hallucinations. Sometimes the condition of the nervous system resulting from loss of sleep tends to perpetuate the insomnia, but if sleep can be secured it

takes much less time in sound sleep to restore full equilibrium of the nervous system and full physical vigor than the time actually lost from sleep. The recuperation seems to be the result of a more profound sleep, for half the hours lost in sleep will be sufficient to undo the damage if undisturbed sleep is obtained.

Physicians are frequently confronted by patients who claim that they "do not sleep a wink," ever—or at least have not for several nights, weeks, or even months past. Except for an occasional case where a few nights have been passed without sleep, absolute insomnia is extremely rare—and it is a dangerous condition, as indicated by its effect upon the nervous system. Those who claim not to sleep at all almost invariably secure enough sleep to keep in fair repair the nervous system.

Strictly speaking, insomnia is not in itself a disease, but is one of the most important symptoms of many physical and mental disturbances. In spite of the many conditions that may cause insomnia in certain cases, they usually act as causes only in individuals who are susceptible; for we all know individuals who, apparently, are subjected to conditions that cause insomnia in many other persons and yet they are able to sleep soundly for the required number of hours. Sleep is usually deficient in amount or recuperative effects in those who are "nervous"—whose nervous systems are unstable, either temporarily, chronically, or by nature.

In some more or less rare cases insomnia may result from a family trait not to sleep well, but in these there is usually the unstable nervous system mentioned. The general causes of insomnia may be divided, for convenience, into physical, mental, and psychical causes.

Among the former may be included bad habits of living, embracing improper diet with its digestive disturbances and toxemia, lack of exercise and fresh air, sexual and other excesses, constant overwork, and "busyness;" other physical causes are disturbing environment, change of habits, exposure to cold or sultry or suffocating heat, pain, the use of drugs, especially tobacco, alcohol, tea, and coffee, Bright's disease, valvular heart disease, arteriosclerosis, either high or very low blood pressure, other circulatory disorders, especially anemia, eyestrain, and excessive reading, high altitude, and various toxemias including that of carious (decaying) teeth.

Included in the mental causes are immoderate mental work or activity (for it should be remembered that all mental activity is by no means mental *work*), worry, anxiety, grief, emotional stress, etc. These latter may just as well be considered as psychical causes, though particularly under this third class may be considered the psychoses, neuroses, and psychoneuroses.

A very frequent cause of insomnia is blood deficiencies (anemias), and especially any condition giving rise to an undernourishment of the brain. Most disorders of the digestive tract, either of the stomach or intestines, will produce more or less sleeplessness. Mental workers are much more prone to suffer from insomnia than manual laborers, though physical exhaustion also produces wakefulness. Any form of anxiety or worry carried to bed is apt to disturb the sleep. Fever is another cause of insomnia, but is generally of short duration, and other symptoms usually outweigh the insomnia.

Treatment. Before laying down any rules or plans of treatment, I wish to emphasize the importance of determining the cause of the insomnia, if possible. Each case must be carefully analyzed, but even with the greatest care in studying the individual case it is sometimes not an easy matter to determine any specific cause or causes. But at any rate each possible cause should be considered, and it is likely that by "elimination"—of possible cause after possible cause—some definite origin of the insomnia can be determined.

Above all considerations, hypnotic drugs should be avoided. The ease with which a person who has a period of wakefulness can obtain from his physician some drug to induce or produce sleep by quieting or deadening the nerves very frequently makes him a slave to such a drug. Instead of attempting to determine the cause and remove it, and instead of using some safe natural means to induce sleep, at the least inability to sleep he takes the sleep-producer. Within a very short time by such treatment one becomes unable to sleep without his drug—and thus he often becomes a drug fiend.

Physical causes are, as a rule, much more easily corrected than the mental and psychical, though many times the mental causes can be removed at once, with prompt return of refreshing sleep. The physical causes usually suggest the required treatment. If the diet is at fault—either deficient as a whole or in certain elements, excessive, or improperly combined—a study should be made in order to adjust it to the physical needs and for best health. There must be regularity in eating in some cases, in others the awaiting of a

natural hunger-appetite regardless of hours. There are so many possible considerations of this phase of the treatment, so many individual requirements, that it is impossible to attempt to give here a dietetic treatment that will suit all or nearly all cases. Intestinal toxemia must be corrected in any case, not only for the relief of the insomnia but for the general health. If constipation exists this must be overcome, by proper adjustment of the diet or by judicious use of the enema or rectal or colonic irrigation, the drinking of more water, general and special abdominal exercises and, possibly, abdominal massage.

If there has been a lack or deficiency of general exercise then more exercise should be taken, regularly and daily. Fresh air is necessary at all times, as the lack of it favors toxemia and irritation of the brain and general nerve system. If there have been sexual excesses, habitual late hours, or any other debilitating excesses or dissipation or harmful habits these must be discontinued and the life regulated so as to be more healthful and less exhausting. Included in such habits is physical overwork. Many times greater physical relaxation is required, not only at night-time but also during the day.

Quiet and comparative darkness are essential to sound, refreshing sleep, and the lack of either of these very frequently keeps one awake, or causes one to awake before sufficient sleep has been secured. These, and a suitable bed, and lack of disturbing odors are all included in environment. In the same group may be mentioned cold or heat. Sometimes one will use an insufficient amount of covering, under the impression

that it is more healthful to have some air in contact with the body. This belief is correct, but at the same time it must be followed sensibly. The body must be warm (during cold weather) for the muscles and nerves to be relaxed and for the circulation to maintain an equilibrium indispensable for sound sleep. In warmer months it is frequently impossible to bring about the degree of coolness necessary for prompt and prolonged sleep, but the use of as few coverings as possible will largely take care of this. Sometimes it is necessary to avoid all covering—sleeping as all nature sleeps, in the nude.

In case of pain, various natural measures may be employed for relief of this causative condition—heat, massage, electricity, pressure, bandaging, etc. If tobacco, alcohol, coffee, or tea is a cause, the remedy is simple—stop the drug; for each of these is or contains a powerful drug. Heart and circulatory disorders and Bright's disease may require an extended course of treatment, by diet, hydrotherapy, exercise, manipulation, and other natural measures. If the eyes are at fault, or rather, if they are abused, they may require merely rest for a while or less work than they have been required to do. However, it may be necessary to build up these organs, through improvement of the general health, or through special measures as outlined in my book "Strengthening the Eyes," or both. Occasionally there will be a condition calling for glasses, in which case it may be necessary merely to have glasses fitted or to change to glasses more suited to the existing condition.

If high altitude be the cause of insomnia it may be

that within a comparatively short time one will become acclimated, though very frequently this adjustment can never be made, and one must seek lower levels. If the teeth are carious or if there is pyorrhea the dentist should be consulted at once.

As for mental causes, it may be compulsory for all reading to be avoided for a while, but in many cases it may be necessary only to regulate the reading as to hours and time; avoidance of reading and mental effort after dark or at least later than from one to three hours before bedtime will usually give the body an opportunity to bring about the necessary shifting of the blood, and the brain an opportunity to rest. The various emotional conditions will require regulation, and hypnosis, psychotherapy, or suggestion may be required.

These last-named measures are usually necessary in the psychical conditions (psychoses, neuroses, and psychoneuroses) causing insomnia, but physical treatment is usually essential in these also. As there are usually some problems more or less buried within the subconscious mind, psychoanalysis should be called into use in these cases.

The insomnia of neurasthenia is frequently self-induced, or at least largely so. The victim of neurasthenia has periods of wakefulness and these he feels to be the cause of most of his troubles. When he retires he feels that he will not sleep, and at the same time he is determined that he will sleep. This keeps before him the thought of poor sleep, and it is only natural that he will find it difficult to sleep. His worry keeps him from sleep, and his lack of sleep increases

his worry. Thus he has established a "vicious circle." Sleep is sometimes defined as "the reaction of disinterestedness." When one is so deeply interested in his sleep as the neurasthenic, of course he cannot sleep as much as he should. If he realizes that sleep is less important than rest and relaxation he will lose his worry and find that his sleep becomes as normal as that of anyone else.

Elderly people quite frequently complain of sleeping short hours at night. Usually, however, it will be found that they take short naps during the daytime—after meals, after reading a while, or at other times. Then when they retire early they get a few hours' sleep and are awake early in the morning, unable to sleep more. The total hours spent in sleep will usually be found to be sufficient. Real insomnia is rare in the aged, and when it is present it is usually due to some pathological condition. But usually the aged require somewhat less sleep than younger people. If old people will remain awake more during the day and retire somewhat later than usual they will be able to sleep later in the morning, if they desire to make this change.

As for more specific rules for the treatment of insomnia these must be in the main general, though perhaps less so than what has already been given. The personal hygiene of the patient must be the best possible. All habits should be well regulated, and one of the chief of these is bowel activity. The bedroom should be thoroughly ventilated (though it is frequently best to avoid direct breezes), and quiet and dark. If possible see that there is no loud talking, playing of

piano, phonograph or radio, or dancing within the house or in the immediate neighborhood—at least for a few weeks or until the habit of sleeping is again established, or until any internal or systemic irritation has been removed. A monotonous noise, however, or soft music may be of value in inducing sleep.

Of greater importance than is considered by many is the bed itself. The springs should be firm, “giving” only with the pressure of the prominent portion of the body, and not weak and soft so as to allow one to roll to the centre or side or into a ball. The mattress also should be firm and smooth. One sleeps much better on a reasonably hard bed than upon a so-called “luxurious,” soft and yielding one. Feather beds are an abomination but, fortunately, are rapidly going out of use. It may be necessary to have extra protection under the mattress in order to keep cold air from coming up through the mattress, but this should be used only when needed, in cold weather. Frequently one will be wakeful because the covers are too heavy. Warmth is necessary, in colder months, but it is possible to secure this with light-weight blankets or other covering, and such only should be used.

If one's work is mental or sedentary, exercises taken just before retiring will re-distribute the blood sufficiently to cause a normal sleep. Long walks are especially beneficial, and particularly if taken the last thing before retiring. If one is not overworking physically, a walk to the point of wholesome fatigue and then some mild stretching and bending movements may prove to be all the “treatment” one will require. If exercises are taken they should be in a thoroughly

ventilated room, or on the porch or elsewhere out of doors. No reading should be done within an hour of bedtime, unless it be light or monotonous—nothing to hold deep interest. Playing some frivolous game may be very helpful.

If the work is strenuous physical labor, then light exercises while reclining may be taken to advantage, especially reaching beyond the toes while seated and keeping the knees straight. This overcomes spinal tensions of labor; but it also stretches the blood vessels of the lower extremities and tends to call the blood away from the brain. For this reason it is a good exercise for the mental worker also.

Occasionally a very light meal taken just before retiring will help induce sleep, especially for the nervous and irritable and the mental worker. But the meal should be at least three or four hours after the regular evening meal, and should consist of wholesome food. A few whole-wheat crackers and a glass of warm milk make a good "night cap" for many; the milk alone is sufficient for many. A ripe banana or an apple or some other fruit will prove effective in many cases, but nothing known to be "indigestible" for a particular individual should be taken by that person, merely because it is satisfactory for some others. And no food should be used to tempt sleep until some of the other measures have been tried without success. In any case the last regular meal of the day should be light, of easily digested foods, and unsuiced. Coffee and tea especially should be avoided at this time, and particularly if one is not accustomed to them.

Various water treatments have been used to overcome

insomnia, but no one water treatment will "work" in every case. For insomnia from cerebral congestion one may use either the hot foot or hot leg bath; in either of these baths the members of the body bathed are completely immersed, and a quick dash of cold water is given after the hot bath, which is continued up to half an hour. The flowing foot bath is excellent. About one-half inch of cold water is in the tub in which the patient stands and the water is constantly flowing in and out of the tub, not getting deeper but maintaining a uniform cold temperature. The sole of one foot rubs the top of the other and every quarter of a minute the feet change positions. The friction is kept up constantly during the bath—which continues until the feet are red. This is followed by dry friction to the feet. Dry heat may be applied to the legs and feet; or hot packs to the legs followed by vigorous cold friction to the legs; the heating compress (cold wet, covered with dry flannel) may be applied at night and kept on all night. The wet girdle is helpful in many cases; in others the neutral or barely warm tub bath, for an hour if necessary; in still others the hot bath, or the cold friction, especially to the legs; or the head-cap of porous cloth frequently sprinkled with cool water.

What is considered the sovereign remedy for most cases of insomnia is the wet pack. A large woolen blanket is spread on the bed, then over this is placed a large sheet, wrung from water at 50 degrees to 70 degrees Fahrenheit. The patient lies on this so that the top edge of the sheet is somewhat above the shoulders, the lower edge a foot or more below the feet. With the arms of the patient held over the head, one-half of the

sheet is wrapped snugly about the body, fitted about each leg; then the arms are placed close to the sides of the body and the other half of the sheet wrapped closely, and the feet are well covered. The left half of the blanket is now brought about the right side of the body, fitted snugly about the neck and shoulder; the right half is then brought about the left side of the body; then the feet are carefully wrapped. The most important consideration is to carefully exclude all air by proper wrapping of the blanket. The patient may now remain in this for hours, if sleep comes, but if the pack does not produce sleep within an hour it should be removed and good friction applied. Heat should be applied after removal of the pack if reaction to warmth has not been established, but this will be rare; if reaction has been established, and especially if there has been sleep, a cool or cold bath of some kind should be given when the pack is removed.

If there is irritability of the brain causing insomnia, the long neutral tub bath may prove soothing, given at bedtime. If restless, use tepid sponging, massage to head, or rub the spine or legs. For rapid heart activity causing insomnia an ice bag over a wet cloth may be placed over the heart.

A cold douche to the spine and to the legs may be used in some cases, if convenient. Any small tubing that can be attached to the bathtub faucet may be used for a satisfactory douche when necessary. This treatment is good in case of cerebral congestion, but the neutral douche may be given when there is general irritability.

Massage is very excellent in case there is cerebral

congestion or general irritability and restlessness, also where there has been excessive mental or physical activity or sedentary occupation for long hours. The massage may be general, but when applied to the extremities or the spine or both it will usually do all that it can do when applied generally.

Any of the various systems of spinal treatment may be considered, and each has many satisfactory cures to its credit. Among these are naprapathy, osteopathy, chiropractic, mechanotherapy, neurotherapy, spondylotherapy, etc. But an untrained person may be able to secure good results by giving even the crudest (but not harsh) massage or rubbing movements and gentle pressure upon the spine from above downward while the patient is lying face down. If these manipulations follow hot spinal packs they will usually be still more effective.

Going to sleep should be made a habit—in the same way that you make a habit of doing numerous other things at certain hours of the day. This habit well established will be a very valuable asset throughout your life.

DREAMS

It has been said that every person dreams, whether or not each one is able to recall any dream or even that he has had a dream. But nearly every person is able to recall that in some period of his life he has dreamed. Some claim that they dream every night, some that they dream constantly every night; and many of the latter will claim that the dreams prevent them from sleeping

soundly or from securing refreshing sleep. Those making such claims as the latter, however, are in error, for it is more likely that it is the "light" and disturbed sleep that makes dreams possible; furthermore, and of greater import, dreams really conserve sleep—the character of the dream is so changed from reality that the dreamer is not awakened.

Dreams are merely subconscious thinking; they take place without the control or supervision of the conscious mind, the ideas coming without selection and without apparent reason. Because the results of such thinking are subconscious or unconscious and are fanciful, fabulous, unreal, we do not call them thoughts, but phantasies. But if the truth were known, it is the activity of the subconscious mind—the phantasies of night dreaming or day dreaming (wool-gathering)—that constitute the greater part of our mental activity, and, if understood, would display our real character more than our conscious mental processes and represent the true desires of the individual.

Like the iceberg with its nine-tenths under the surface of the water and with its movements more under the control of the undercurrents of the ocean and less under the control of the wind on the one-tenth above the surface, so the human mind is largely "below the surface" and the conduct or course of the individual is determined not solely by the recognized mental processes, but largely by the subconscious mind. And if dreams could be correctly interpreted, frequently we would be able to recognize our true governing emotions; for it is said that "the dream phantasy always

has to do with something that is very close to the heart of the dreamer."

While it may be impossible in many instances for the individual to find the connection, there is usually a direct connection between the dream and things or thoughts that impressed the mind during the last waking state. Because dreams are symbolic, because they are "excursions into the world of phantasy, the world of unreality," these last waking experiences and those of the entire dream appear in complete disguise, as a rule. And the dream fulfills a wish, though usually this wish is repressed during the waking state—or, perhaps more commonly, it had been repressed long ago, probably in very early childhood, but still is a controlling influence upon subconscious thinking.

It does not seem reasonable that every dream always has a significance so far as the psychoanalyst is concerned, for it seems more rational to believe that sometimes certain conditions of the body give rise to dreams of a particular nature—through subconscious misinterpretation of impressions upon the sense organs. As illustrations, a perfume may give rise to a dream of a walk through a garden, possibly of a trip to the flower-laden Orient; a chime, to a dream of music and dancing; or an alarm clock, to a dream of a fire with the clanging bells of the fire engine; insufficient covering, to a dream of a trip to the arctic regions; digestive disorders, to a dream of swimming or floating, possibly to floating through space; pressure on the chest, to some form of nightmare. Exceptionally fantastic dreams frequently result from the use of certain drugs, as opium and Indian hemp (*Cannabis Indica*).

Occasionally dreams have been a source of stimulation to the faculty of imagination. Poems and music, books, lectures, etc., have been partially mapped out in dreams. We are told that *Kubla Khan*, a poem, was composed in a dream but that much of it was forgotten on awaking; and *The Devil's Sonata*, by Tortini, is said to have been inspired by a dream. The dream itself is not a serious thing, even in cases of nightmares, night terrors, and other less disturbing dreams. Even the cause of any dreams may not be serious, though it is usually some disturbance of digestion, of circulation, of the heart, nerve system, or other organ, structure, or function that makes dreams constant or of a disturbing nature. One should ignore dreams, for the most part; or if they be disquieting, every effort should be made to correct any physical disorder—particularly any digestive disturbance. If a particular form of dream comes repeatedly, or if the dreams are usually such as to leave an undesirable mental impression during the waking state, it would probably be best to be “psychoanalyzed”—to consult a psychoanalyst with the idea of having the dreams “interpreted.” Very frequently the dreams themselves alter in character or cease to appear and any effects they have had readily disappear after they have been analyzed and their meaning made clear.

SOMNAMBULISM (SLEEP-WALKING—NOCTAMBULISM)

In somnambulism, representing the dream phantasy in simple form, the patient performs many of the sim-

ple and frequently many of the complex acts of the waking state—while still in the unconsciousness of sleep. It is merely a state of acting, frequently symbolically, the patient's unconscious phantasies. Upon awaking the patient recalls none of his experiences during the night, though as the memory of these experiences may be awakened (by psychoanalysis) it is evident that they make some register upon the conscious mind. However, the subjects of somnambulism have no knowledge whatever of what they are doing during the actions of sleep—even though the law sometimes holds them responsible for deeds committed during the sleep-walking stage.

Most difficult movements are accomplished with marvelous ease and dexterity by the somnambulist, yet his senses are completely blocked—he neither hears nor sees, though his eyes may be wide open and staring, though they may be closed or partly closed in some cases. The sleep-walker may go long distances or climb great heights, or walk on narrow ledges or cross streams or narrow foot-bridges, solve mathematical problems or write or paint or draw, or even attempt suicide or murder, etc.

The physical causes of sleep-walking are indefinite, for the condition seems to be mainly a psychic one. It is a special illustration of phantasy-thinking due to the carrying over of a strong, persistent wish or idea from the waking to the sleeping state, though usually the conscious wish or idea has been repressed—possibly every effort having been made to drive it entirely from the mind.

Quite frequently the condition indicates a disturbed

conscience, the sleep-walking of Lady Macbeth being a classical example. Somnambulism is somewhat analogous to the hypnotic state and is similar to sleep-talking or somniloquy.

But in the sleep-walker there is usually a neurotic strain or a highly sensitive and somewhat unstable nervous system, intensified by habits of life that prevent tranquilization of the nerves. These habits may be the various dissipations or anything which causes a drain upon the energy.

Quite frequently the sleep-walking begins at about the age of puberty, because of vigorous repression of sexual wishes, when the somnambulism is the result of these wishes seeking symbolic expression or outlet. Digestive troubles are frequently the direct and exciting causes of an individual "séance" of sleep-walking, by preventing deep and peaceful sleep, though it appears that the sleep of the somnambulist is frequently unusually deep. Any condition that tends to produce more pronounced dreaming or dreams of a disturbing nature may produce a period of sleep-walking in those susceptible, especially distressing heart and lung conditions.

In the treatment of these cases it is necessary to determine whether the cause be mainly psychical or physical. If it be the former, then psychoanalysis may be the main treatment—possibly the only treatment required. If there is known to be a repressed idea or thought this should be "aired" and the problem faced until a conscious solution has been disclosed and put into effect. If the conscience is disturbed, this must be cleared by confessing to some one who can be of definite

assistance in clearing the difficulty. Otherwise, the physical condition must be improved and every element tending to prevent sound and tranquil sleep must be avoided.

In case an individual is discovered in the act of walking in his sleep he should be watched to see that he does no harm to himself or others, but he should not be awakened until he is again safe in bed. If his acts during the somnambulistic state are understood, it will help to prevent the condition in the future to confront the patient with the meaning of them after he has awakened or been awakened. This serves somewhat the same purpose as a "confession." However, as the somnambulistic state is quite akin to the hypnotic state and the patient is frequently susceptible to suggestion it may help materially to give, while the patient is in the act of sleep-walking, the oral suggestion (in a calm, monotonous voice) that the patient will sleep soundly, or that the problem (specifically named, if his acts are capable of interpretation) has been solved or will be solved.

SOMNILOQUISM (SOMNILOQUY)

This is merely the habit of talking in one's sleep. Almost anyone is apt to talk in his sleep occasionally if his dreams are vivid enough, especially if they are perplexing or particularly joyful. But it is the same class of people who walk in their sleep who are most apt to talk in their sleep—those who have problems on their mind or those who have some physical disturbance, particularly digestive disorders, to prevent quiet and

peaceful sleep. As those who talk in their sleep do so rather irregularly, as usually but a few words are spoken, and as there is no danger of harm to the talker or others, this condition may be practically ignored, except that care should be observed not to take problems to bed, and the digestive or any other disturbed function should be improved and, if possible, restored to normal.

NIGHTMARES

(THE "THROTTLING DREAM-DEMON")

These are "painful dream states"—sensations of oppression or suffocation sometimes being extremely distressing. The sensations are different in different individuals and even in the same individual at different times; there may be extreme fear, anxiety, horror; oppression or great weight over the heart; or the patient may seem to be pursued by some monster or serpent or beast; or he stands on the edge of a cliff or a tall building and cannot take himself away; or perhaps he is falling from such a position. In any predicament he is powerless to save himself from the danger shown in his dream. By crying aloud or jerking or making some move in self-defense, after a seemingly long period of suspense, he may awaken himself.

Some of the most distressing nightmares sometimes appear before serious mental disturbances, but there is frequently no impending mental disorder. Instead, most cases are the result of indigestion or overloading the stomach. Sleeping upon the back and lying with the head low seem more inclined to induce nightmares,

when the digestive or other condition is favorable, than any other positions, though any cramped position may induce them and insufficient ventilation is another common cause.

In attempting to prevent these painful dreams the main consideration is diet. The last meal of the day must be light and a few hours before retiring, and only simple, wholesome foods must be taken—no rich or highly spiced dishes, and no alcoholic or other disturbing drinks. It is best to avoid a meat diet; or if some meat is considered advisable, have it not more than at one meal a day (better at the noon meal), preferably not more than three times a week. There should be adequate ventilation in the sleeping room, though it is not advisable to have a draft over the patient. All influences tending to affect the health in any way unfavorably, particularly of the nerve system or through the digestion, must be carefully guarded against. If there has been a physical or mental strain, avoid a repetition of the labors until stronger.

The best sleeping position is the following: First, lie face downward, then turn the head to the left, half flex the left arm, and partly draw up the left knee. This turns the body partially on the right side, particularly the upper part of the body, and this frees the chest for proper breathing and prevents pressure upon the heart or upon the spine and chief abdominal blood vessels by gas or a distended stomach.

NIGHT TERRORS (PAVOR NOCTURNUS)

We may say that the nightmares of children are

known as night terrors, and yet there is a difference in the nature of these two disturbances of sleep. While in nightmares the sleeper dreams dreams, in night terrors he sees visions or rather has hallucinations. In the latter there is frequently a constancy of the hallucination, while in nightmare the dreams usually vary in character. Ill health is at the basis of nightmares, the dreamer is able to recognize anyone who is with him when he awakes, and he remembers his dream; while a general neurotic tendency underlies night terrors, the dreamer does not recognize his nurse or other attendant, and he has no recollection of his dream (or vision). He may go to sleep again without having gained full consciousness.

An excellent description of the disturbance is given by Cautley, as follows: "The attack comes on in the early part of the night, an hour or two after going to sleep. The child suddenly starts up with a piercing shriek and is found sitting up in bed, standing on the floor or hiding in some part of the room, in a state of terror and mental confusion, and sometimes a sense of suffocation. Sometimes he is very pale. He may scream with fright, and cry out inarticulately and unintelligibly. He is oblivious of his surroundings, does not recognize his nurse though he may cling convulsively to her, and has hallucinations of vision, rarely of hearing. His pupils are dilated, eyes wide open and staring, the body trembling, hands clenched or moved as if in self-defense, and he sweats freely."

An individual attack of night terror may last for a few minutes or it may last for an hour or so. After the child is quieted there is little likelihood of other

attacks the same night, though they may come on night after night. Usually they come on only infrequently.

Night terrors are distinctly a nervous disorder of early life (usually from the third to the eighth year, especially the fourth year), occurring usually in children of neurotic inheritance, and there may be other sleep disturbances associated with it. Frequently worrying about the school work or some excitement, or fright by darkness, shadows, gruesome pictures, ghost stories etc., will bring on an attack. It seems that boys are more often affected than girls—about three to two. Enlarged tonsils and adenoids or some digestive disturbance may bring on an attack.

In preventing or overcoming the condition every care must be given to maintain the nervous stability of the child. The diet should be carefully selected, to insure provision of all the food elements for complete nutrition, especially the mineral elements and vitamins furnished by the fruits, green vegetables, milk, and whole-grain products. But equal care should be observed to avoid overfeeding and rich, indigestible dishes. The last meal of the day should be light. Piecemealing should be discouraged but the child should be encouraged to drink water freely. The action of the bowels must be observed and any tardiness corrected. Special treatment may be necessary for reduction of enlarged tonsils or adenoids, or for the correction of anemia. For the latter condition cod liver oil may be given in addition to a nourishing diet, but Phytamin would be preferable, as it is rich in plant iron, phosphorus, and calcium, besides the three vitamins A, B, and C. The environment must be such as to prevent

aggravation of the nervous tendency of the child. Care must be taken that the child be free from excitement and protected from pets, ghost stories, "blood-curdling" tales, and unpleasant sights. There must be an abundance of fresh air and sunlight provided, and as much time out of doors as possible should be spent, but not in competitive games.

If the child is attending school the parents should, if necessary, visit the school and learn from the teacher the conditions surrounding the child and any adverse conditions should be corrected; as too much school work done at home may be a cause, the child should not be permitted to study later than two hours before bedtime.

The hygiene of the bedroom must be observed, but in these cases it may be preferable to have a faint reflected light in the room to prevent the terror of utter darkness quite frequent in such children. A luke-warm sponge bath should be given every night immediately before retiring.

This particular manifestation of nervousness is usually quite quickly corrected, and no serious after-effects need be feared.

DAY TERRORS (PAVOR DIURNUS)

While day terrors are not disturbances of sleep they and night terrors are practically identical as to the attacks, and the day form may be mentioned here. From apparently no cause a child, perhaps while at play, has a sudden attack of terror with screaming; and

paroxysmal screaming from no discoverable cause comes on in the young infant. Such children have had the misfortune to inherit very susceptible nervous systems, easily disturbed by digestive and other conditions that would not affect those with more equable nerves. These attacks may be the "hang-over" of a previous fright, by sight, hearing, falling, etc. The same treatment in general is required for this condition as for night terrors.

CHAPTER IX

Torticollis or Wryneck

TORTICOLLIS is a condition of contraction of the cervical (neck) muscles that causes a twisting of the head upon the shoulders. Fortunately it is not especially common. It usually affects one side only, and is found most frequently in the young. It occurs about equally in the two sexes and on the two sides. There are two main types of torticollis, the congenital and the acquired. The latter type is divided into two principal groups, the common acute torticollis and various irregular forms; among these irregular forms are included spasmodic, paralytic, and rachitic torticollis, and a few other less important forms.

Congenital wryneck is painless, while the acquired form usually begins with pain, though in time this disappears and only the distortion remains. Thus we may consider an acute and a chronic form of acquired torticollis. Various neck muscles may be involved, but the one usually affected is the cord-like muscle running from the mastoid prominence back of the ear to the inner end of the collar bone, which turns the face toward the opposite side when it contracts—the sternomastoid muscle. As this muscle on one side contracts the entire head is pulled over toward the opposite shoulder.

CONGENITAL TORTICOLLIS

This condition, also called “fixed torticollis,” is

sometimes discernible at birth, but it is far more usual not to detect it until the child is old enough to support its head, many times not until considerably later. Because of the early showing of the deformity, especially when it is noticeable at birth, and because of the involvement of all the structures on one side of the neck, it is considered to be due to a cramped position maintained in the mother's womb.

Sometimes the cause is apparently an injury received when instruments were used for traction to hasten or facilitate birth. This injury may have been a rupture of a muscle, followed by hemorrhage into the muscle, and the scar resulting from the injury and inflammation later caused contraction. Or it may have been an injury to the cervical spine or to some of the nerves of this region. There may have been neither of these, but a severe wrench or strain on one side, which caused the head to be held toward that side to give relief. After the head had been held in such a position for some time it then became habit and the position was not altered. This would, of course, cause a difference in growth of the muscles and other tissues on the two sides. As this latter condition would be developed after birth, wryneck from such a cause could not be considered as congenital.

In congenital wryneck there may be little change in the structures of the neck except the contraction. But in some cases there is an excess of tendinous tissue and the muscle structure itself is reduced in amount. The most remarkable condition resulting from the posture is the facial asymmetry. As the child develops, the skull becomes deformed in some degree (sometimes

greatly), the face is flattened on the affected side, the structures of the face may be pulled downward toward the contraction, and the concavity of the cervical spine is toward this side. Later other curvatures of a compensatory nature develop, and usually the shoulders are rounded.

Treatment. Quite naturally, the earlier the deformity is detected and given treatment the more rapid and complete will be the correction. The treatment consists of fomentations (hot wet cloths), massage, and stretching. Hot cloths covered with dry flannel should be applied for half an hour or more, then the contracted tissues should be quite vigorously massaged, but preferably without friction to the skin—that is, the hand should be firmly placed on the skin and the massage given by moving the skin with the hand. Then the head should be pulled to the opposite side (while some one is holding the arm so as to permit of a good stretch to the neck), and the massage again applied to the stretched tissues. Except for the hot applications, these treatments should be of about ten or fifteen minutes' duration, and given twice a day. Much can also be done by having the sleeping posture of the child such as to work toward gradual stretching of the contracted neck muscles. Naprapathic, osteopathic, or some other method of spinal manipulation may be used to advantage in most of these cases.

While in some instances operation may be necessary, I believe it will be so only rarely; and certainly it should not be resorted to until such simple measures as suggested have been given a thorough trial, of several months. It should be remembered that the tissues

of the small infant, and of the growing child of any age, also, can be molded pretty much as desired, if one uses the corrective measures persistently. Surely if clubfoot in children can be corrected by these simple measures (and it has been cured by such means, in numerous instances), wryneck should prove equally responsive.

ACQUIRED TORTICOLLIS

This form is much more frequently met with than the congenital form, and eight out of ten cases begin before the eleventh year. In the acquired form we have, as stated, acute torticollis and several irregular forms.

Acute Torticollis. A well-known type of this form is that due to exposure to cold; another is the rheumatic stiff neck. But these are usually of short duration and respond quite readily to fomentations or hot compresses, and later, after the soreness and sensitiveness have somewhat subsided, gentle massage. Treatment by the various heating lamps is also of considerable value in these cases.

The more troublesome cases are those resulting from disease or injury of the muscles, or from irritation of the nerves. The last cause produces a leading form of acute torticollis. Tonsillitis, diphtheria, measles, and other diseases or disorders of the throat, pharynx, and posterior portion of the nose may produce, as a sequel, sufficient nerve irritation to cause wryneck. Toothache or earache may develop before the torticollis. The glands at the side of the neck may be enlarged

and inflamed and cause it. The affection comes on quite slowly, and the position of the head is only gradually altered from normal but it remains fixed in the abnormal position, and the pain caused by voluntary movements toward correcting the posture tends even to accentuate the deformity. A comfortable sleeping posture is difficult to find. The usual one-sided deformity is produced, but occasionally the head may be pulled forward or backward by bilateral involvement of the muscles. After the pain eventually leaves a chronic wryneck remains. Those of the nervous temperament are more susceptible to this disorder, but the condition itself develops a high degree of nervousness.

Treatment. At the very onset every effort should be made to remedy the toxemia caused by the previous disease and to correct any remains of that disease; or, in case of injury of the neck muscles there must be given rest and suitable hot or cold compress treatment. If the muscles themselves are diseased, similar treatment may be corrective. In almost any case a short fast or a fruit-juice diet, with daily bowel cleansing by means of the enema, and a general sweat bath by tub or blanket or wet-sheet pack will be helpful in hastening elimination and removing the remains of any toxic agent acting as a cause or to aggravate the neck condition. After such a radical diet (continued only two or three days, usually), a fully nourishing diet should be given, but one devoid of toxin-producing elements. The strict milk diet should be considered. Cod liver oil or Phytamin would be of benefit.

An effective treatment in many cases is the "heating

collar," made of cotton or of wool. This should completely cover the neck from the shoulders to the ears. It should be pinned snugly in place and, if necessary for support, stiffened somewhat by adhesive tape. The correct manner of giving the compresses or fomentation should be adopted for best results. Woolen flannel is preferable to any other cloth, but if not available then any suitable material may be used. The flannel should be three or four thicknesses, large enough to cover the neck and shoulders and wrung from *hot* water. Over this should be placed dry flannel much larger in size, and over this oilcloth or mackintosh. This retains the heat and makes an effective local vapor bath. The fomentation should be changed every five minutes or so to keep it hot, and continued for an hour or more, especially in severe cases and where there is much pain; but after each thirty minutes it should be removed and a cold wet towel applied for a minute or two. When the fomentation is removed finally, a very cold wet cloth (wrung fairly dry) should be placed over the entire area for a minute or two. Following this the massage should be given, and then the neck covered with dry flannel. But if there is no pain the cold wet cloth may be kept on longer, or applied and then covered with a dry flannel, both to be kept in place for an hour or longer. Good friction or massage should then follow its removal. Such treatment is very effective in reducing any inflammation in the throat.

The treatment so far given should prevent or reduce the pain, and when there is no longer any considerable sensitiveness the massage treatment and traction should

be given. In giving the traction the head should be only gradually pulled beyond the normal face-front position, but an attempt should be made to pull the head a little farther at each succeeding treatment. Later, exercises should be given to rebuild the shrunk and weakened muscles. No definite time limit required for treatment can be given, but treatment should continue for several months, if necessary, before abandoning it for surgical treatment if eventually this should be required. In the chronic form especially, suggestion is a very valuable part of the treatment, but it is frequently of benefit in the acute and spasmodic forms.

IRREGULAR FORM OF TORTICOLLIS

This form of wryneck, known also as spasmodic wryneck, is convulsive in nature and in certain respects somewhat resembles chorea and writer's cramp. This form is sometimes found in the same cases with the constant contraction, but usually they are distinct. The spasmodic form is sometimes extremely tormenting, the spasms frequently coming on without warning, or they follow a feeling of fatigue and stiffness in the neck. It appears almost solely in adults but not in old age, and usually in neurotic individuals—frequently with a neurotic family history. In America men seem to be more frequently affected than women, though the reverse is said to be the case in Europe.

The underlying cause is almost invariably an unstable condition of the nerve system, but associate and

exciting causes may be straining occupational postures, overwork, exposure to cold, direct injury to the neck by a blow, irritation of enlarged cervical glands, hysteria, caries of the vertebræ, etc. The trouble comes on slowly, the symptoms being an uncomfortable sensation of stiffness and drawing, with jerking of the head. In time the contractions may be extreme, with great disfigurement, but within varying lengths of time relief is given by relaxation; but the spasms return and the frequent and severe spasms in time create a permanent deformity. When there is distinct pain at all it is frequently that of a cramped muscle.

The position created by the muscular spasm is that of a typical wryneck, but in extreme cases the face may be turned completely toward the opposite shoulder, with the chin raised. Also when one of the muscles of the back of the neck is involved (the trapezius), the side and back of the head are drawn down toward the shoulder of the affected side and that shoulder is elevated. Sometimes the head is drawn downward, and occasionally backward—in rare extreme cases of this latter kind the face looking almost horizontally upward. The jerking movements are repeated every few minutes, it being impossible to hold the head still for long at a time, but during sleep the spasms subside. Physical or mental fatigue, mental excitement, and emotional outbreaks aggravate them. The course of the disease varies, but a spontaneous cure is uncommon.

Treatment. Unless a curative treatment relieves the general nerve irritability and builds up the patient's general health, even an apparent cure will prove only temporary. Occupation or any other condition causing

or aggravating the spasms must be avoided, if possible. Massage is important in these cases as in others, and spinal manipulation by naprapathy, osteopathy, or some other system that includes in its treatment the manipulation of the muscles and ligaments as well as of the vertebræ. Exercises should be given when possible.

OTHER VARIETIES OF IRREGULAR TORTICOLLIS

Paralytic Torticollis. Sometimes as a result of a severe case of infantile paralysis some of the neck muscles may be paralyzed. In these cases the opposite muscles (the normal ones) pull the head into the position of a wryneck, because they are not restrained—the paralyzed muscles do not oppose them. Massage and the other manipulations (especially massage) may tone up the paralyzed muscles and gradually bring about at least some degree of nerve activity in them so as to help them hold the head more nearly in the normal position.

Diphtheritic Torticollis. As a sequel of a severe attack of diphtheria improperly treated there may be a somewhat similar paralysis of the neck muscles, but in this case it is usually the muscles at the back of the neck that are affected and the head droops forward because of the unopposed pull of the muscles at the front of the neck. Every measure for eliminating the toxemia responsible for and produced by the diphtheria and for toning up the nervous system and the body as a whole should be used, as well as the massage.

Rachitic Torticollis. In rickets that produces a backward curvature in the lower regions of the spine

there will be produced a backward tilt of the head to balance it; this is sometimes aggravated by spasms of the muscles at the back of the neck. Treatment for the correction of the rickets (full nourishment and Phytamin or cod liver oil) and massage, manipulation, and exercises for correcting the curvatures will usually quite readily correct this form of wryneck. In poorly nourished infants there is sometimes a somewhat similar posterior wryneck, but without the curvature lower down. Proper nutrition will remove the torticollis.

Ocular Torticollis. Occasionally, but not often one will develop the habit of holding the head to one side because of a visual defect which the unnatural position partially corrects. In rare instances the muscles may become partially "set" in this position, but usually when it is not desired to use the eyes in such a way that the one-sided position is of advantage the head assumes its normal position. Correction of the visual defect may be possible by special exercises, or occasionally glasses may be required.

A supporting collar may be required in severe cases of any of these various forms but should usually be applied by a physician. Persistent application of the treatment given will usually make such an appliance unnecessary. General hygiene should receive attention in all cases. In any case simplicity of diet is necessary, avoiding stimulants of all kinds. Plenty of sleep is required, and due attention is to be given to fresh air and relaxation, but walking and moderate general exercise should be a part of the daily regimen when possible.

CHAPTER X

Neuralgia

NEURALGIA briefly is pain in a nerve. But as the term is used it means a sensory nerve disturbance, without inflammation, with paroxysmal pain as the chief manifestation. It is not a definite disease in itself, but is an expression of one or other of many disorders, and the varieties of neuralgia are named according to the nerves or structures involved. The complaint is more common in middle life and in women. A susceptible nervous system may be due to heredity. Better diagnostic methods have made it possible to reduce the number of true neuralgias, but there remain many definite neuralgias and numerous cases of most varieties.

Causes. Among the many conditions which may serve as causes are: disease causing general debility; the various anemias, including that from excessive hemorrhage; intoxications, from toxins produced in the system—as “autointoxication,” or from typhoid, malaria, influenza, tonsillitis, measles, gonorrhea, diabetes, and Bright’s disease—or those derived from outside the body—as alcohol, tobacco, lead, arsenic, mercury, and copper poisoning; organic diseases of the nervous system—as locomotor ataxia, general paralysis, cerebral and spinal disease; rheumatism, gout, and arthritis; inflammations of the auxiliary sensory nerve centres, called ganglia; disturbances of the nerve trunks, as by pressure from tumors or other structures,

from bullets or other weapons, cuts, lacerations, fractures, and dislocations, and mild inflammations of the nerve; functional neuroses, and strong emotions; early stages of arteriosclerosis. Exposure to cold is a very common cause, especially when associated with dampness. There are also some cases due to psychic causes, but in these there is usually a physical disorder capable of causing some degree of neuralgia.

General Symptoms. The pain is the main symptom. It varies considerably in extent and severity, but is usually paroxysmal and is described variously as burning, tearing, biting, darting, piercing, stabbing, boring, cutting, like a hot rod or an electric shock, etc. It comes with lightning-like suddenness and may leave as suddenly, after varying lengths of time—to return, possibly, after a few minutes or perhaps not for days. It is usually on one side only. Pressure on the nerve causes pain, especially when applied to the points where the nerve emerges superficially. Pressure sometimes greatly aggravates the attack or starts one when the pains were mild or absent, but deep pressure frequently relieves, as do heat and cold at extreme degrees. Sometimes a threatened attack is announced by mild twinges or “ripples of pain,” and there may be a general vague uneasiness.

The skin supplied by the affected nerves may be blanched at first, then flushed, possibly somewhat edematous (swollen and puffy), and the skin may become pigmented, reddened, eczematous, or thickened. Sweating may be profuse at this point. The urine may be considerably increased in amount, as may also the milk in nursing mothers. The hair may turn gray,

entirely or in spots, and it may fall out or become heavier or coarser. The blood pressure is usually increased during attacks, but the pulse is usually slow.

The patient becomes peevish and irritable, moody and morose and mentally depressed, from loss of sleep and pain, and there may be considerable loss of weight from these causes and reduced nourishment from the loss of appetite.

The types of neuralgia that are more frequently met with will be taken up separately.

TRIFACIAL NEURALGIA

By this is meant neuralgia of the fifth cranial nerve, called the trifacial nerve, as it has three main divisions supplying the eye and the skin and structures of the face, tongue, teeth, and throat. Neuralgia of this nerve is more common than any other, but there are two distinct types. One is a comparatively mild neuralgia, a symptom of some disturbance of its smaller branches, while the other is a very severe form, known as *tic douloureux*, due to some disturbance in the nerve ganglion that gives rise to the three main branches of the fifth nerve after it leaves its origin in the brain. Neuralgia of this nerve is usually found in middle life, and it occurs mostly in women. The exposure to winter winds and cold is a frequent cause.

The less severe form comes earlier in adult life, and may be caused by rheumatism or affections of the teeth, throat, or nose, injury, hysteria, syphilis, and weakening diseases. The nerves may be sensitive on

the face. The pains may linger for days, though they are usually intermittent.

Tic Douloureux is an extremely severe form of neuralgia coming on without apparent cause, affecting one side only, as a rule, and appearing about or after middle life, and equally in the two sexes. Any branch of the fifth nerve may be affected, but the branch to the eye is usually most severely affected. The attacks come and go, but the intervals between attacks gradually shorten and the attacks constantly become more severe and last longer, until the patient may have no complete relief from pain at any time. Various influences may start the attacks, as talking, protruding the tongue or other movements of the facial muscles or tongue, a cold draft of air, or taking anything cold into the mouth, swallowing, and touching the skin over the painful nerves. "Most commonly the pain starts in the upper lip, and then with agonizing intensity it darts up to the brain or into the lower jaw, and sometimes into the tongue, roof of the mouth or into the ear" (Yawger). The paroxysm may be over in a moment or it may last for hours. During the severest pain it is common for the tears, saliva, and nasal secretion to pour forth in considerable quantities. After numerous attacks the hair may become white, and the face may even become paralyzed. The patients often become nervous wrecks and some have committed suicide, unable to endure the suffering longer. While the condition is not as a rule self-terminating, in some cases the pains have stopped without treatment. Attacks may be frequent and for many years, but in some

cases they appear only at long intervals. One may live long in spite of the affliction.

Senile Facial Neuralgia. This is a facial neuralgia involving the lower jaw, the paroxysms coming on with forcible closing of the jaws, in biting or chewing. The condition is found almost solely in those who have had their teeth extracted. The pressure of plates may be intolerable, or extreme pain may result from pressure from any cause. Except when the pain results without pressure (in which cases the treatment will be the same as for facial neuralgia), care should be taken to avoid the pressure, thus avoiding the cause of the pain.

CERVICO-OCCIPITAL NEURALGIA

This variety involves the sensory branches of the first four (upper) cervical nerves, which are distributed to the scalp, ear, and the muscles attached to the upper vertebræ and the skull. The scalp, especially posteriorly, may be the most painful part, but usually the greatest pain is in the upper neck and particularly to one side of the centre at the base of the skull—half-way between the first vertebra and the prominence back of the ear. Deep pressure here aggravates the pain, as does pressure upon the scalp. Sometimes both sides are affected; the head is held rigidly. This neuralgia may be caused by exposure to cold, injury, strain; tubercular, arthritic or other inflammation of the vertebræ; tumors, lymphatic congestion; and nervous exhaustion, especially from mental strain and emotional imbalance.

CERVICO-BRACHIAL NEURALGIA

There are eight cervical nerves, and this variety of neuralgia is an affection of the lower four. It is sometimes found in connection with cervico-occipital neuralgia. The four lower cervical nerves, after forming the brachial plexus, supply the structures of the neck, shoulder, arm, and hand, and the shoulder, elbow, and wrist joints. The pain of neuralgia of these nerves may be anywhere along the course of any of the nerves or their branches, but is usually about the shoulder or the little-finger side of the arm. The deltoid or shoulder-cap muscle may be the only location of the pain. The elbow usually has a painful spot. Women have this form of neuralgia more than men.

The causes are direct injury, rheumatism or arthritis, disease of the vertebræ or cord or the membranes covering the cord, angina pectoris, or pressure from tumor or other structures. The pains are darting, and pressure along the course of the nerves exhibits tenderness, especially in the arm-pit, or at the elbow or wrist. There may be blanching or flushing of the skin from contracted or dilated blood vessels, and there may be considerable sweating of the part. The muscles may undergo nutritional changes, and the blisters of "shingles" may develop.

LARYNGEAL NEURALGIA

This is a comparatively rare form of neuralgia, affecting some part of the larynx, possibly radiating

toward the ear or the neck. It may be caused by decayed teeth or diseased tonsils, smoking, rheumatism or gout, or anemia.

INTERCOSTAL NEURALGIA

This is a neuralgia of any of the twelve thoracic nerves, which emerge from the cord between the thoracic (dorsal) vertebræ to which the ribs are attached, and extend around the chest between the ribs. Branches supply the back and the chest. This variety of neuralgia is quite common, and the most important next to trifacial neuralgia. As with the previous variety, it is more common in women. The pain is along the ribs, and may cause one to think the trouble is heart disease or, more likely, pleurisy, as the pain is stabbing in character. Points along the rib or ribs may be sensitive, and the pain is aggravated by breathing or any other motion of the chest. "Shingles" (herpes zoster) is quite common in this affection. Among possible causes are exposure to cold, strains in lifting or other muscular activities, tumors, aneurysm (dilation of a blood vessel), or disorders of the spine or spinal cord.

NEURALGIA OF THE BREAST

This condition, also called "mastodynia" and "irritable breast," is usually considered a variety of intercostal neuralgia. It is usually but not always found in women, especially young and unmarried women; the time of appearance is generally when the breast has

attained its maximum development or just at the approach of this stage. Many women have swollen sensitive breasts at the menstrual time and during pregnancy or at the "change" and many girls during the changes of puberty. These conditions are usually a comparatively mild degree of mastodynia, usually reflex in character, from the change taking place in the uterus and ovaries, though the typical and most severe cases are usually associated with an unnatural or ungratified sexual life. In the more severe cases the pain may be excruciating, and even the pressure of clothing may be unbearable. The pain may radiate to the arm or chest, but is frequently localized in the breast, and sometimes only certain lobules of the gland may be affected. On examination the affected breast may appear normal, though it is usually somewhat larger and more firm than is normal. The secretion of milk may begin or be increased. Mastin states that "the subjects of the disorder are usually slender and delicate women, with pale skins, and are generally of the better class of society. They incline to the neurotic type and are often hysterical, given to brooding, dwell upon their sufferings, and frequently become depressed by the fear of malignancy. Such patients may also be subject to neuralgia in other localities, or may suffer from rheumatism."

NEURALGIA OF THE DIAPHRAM

This is not an uncommon variety of neuralgia, and is sometimes very severe. The diaphragm is attached

to the chest wall, in a circle about the body, and the pain may be at any point of its attachment or over considerable or all of this area, and there may be pain in the nerve that largely controls this structure—the nerve comes down through the neck. Breathing, coughing, sneezing, and other actions calling for movement of the diaphragm may be extremely painful, and there may even be difficult swallowing. As with intercostal neuralgia, this form may be mistaken for pleurisy or heart disease. The causes are weakening diseases, malnutrition, anemia, autointoxication, strains from violent coughing, exertion, or injury, rheumatism, chilling of the body, and inflammations of neighboring organs.

LUMBAR NEURALGIA

The nerves affected in this neuralgia are those from the lumbar region of the spine (the “small” of the back). The pains may be at the top of the bony prominence of the hip, in the fold of the groin, and in the external sexual organs. This may be caused by muscular strains, spinal diseases, sexual excesses, and exposure to cold.

Crural Neuralgia is one variety of lumbar neuralgia, and is an affection of a prominent nerve arising from the lumbar nerves that supply the front and inner surface of the thigh. The nerve may be painful to touch at any part of its course, including the groin. Because of greater liability to exposure to cold and injury and strains from muscular activity, men are more subject to neuralgia of this nerve, but

tight girdles with vertical stays may produce it in women by pressure. Other causes are spinal diseases, constipation, diabetes and tumors, congestions and other disease conditions of the pelvic organs.

Testicular Neuralgia may be considered as a variety of lumbar neuralgia, since some of the lumbar nerves are affected. This is often a very severe form, producing agonizing, dull, dragging pain and, sometimes, vomiting and near-fainting attacks, and there may be severe pain in the back or legs. The scrotum is firmly contracted and the testicle swollen and tender yet not inflamed. The exact cause is not known, but sexual excess is considered a factor in its production, also masturbation, varicocele, and ungratified sexual desire—especially the uncompleted sex act and violent “love-making” without the normal relaxation. Constipation and prostatitis may also cause the condition. It occurs mostly in neurotic individuals.

COCCYDYNIA (COCCYGODYNIA)

This is sometimes called “sitting neuralgia,” because it is aggravated by sitting. It is a neuralgia of the nerves arising from the tip of the spine. Bowel evacuation is frequently very painful and, because of this, defecation may be willfully postponed; this may aggravate the neuralgia, since it is frequently due to severe constipation. Other causes are direct injury, as by falling on the end of the spine, prostatic or uterine disease, or neurasthenia or some neurosis. Women are more often affected than men, and because those so

affected are usually neurasthenic or hysterical to a considerable degree the neuralgia may be very stubborn.

RECTAL NEURALGIA

There are numerous conditions that may produce rectal pains, such as hemorrhoids, fissures, foreign bodies, fecal concretions, congestion of the posterior urethra, and inflammations of various structures. But occasionally there is a true neuralgia of the rectum. Prostatic congestions and prolapse of an ovary may be a cause. In women the pains are likely to be more severe during the menstrual period. Eating may aggravate them. The neuralgia may be preceded by some degree of inflammation higher up in the alimentary tract, especially in the colon.

VISCERAL NEURALGIAS

In some neuroses neuralgia may develop, especially in those of the heart, stomach, kidney, and pelvic organs. Ovarian neuralgias are quite common, especially in young neurotic women. Prolapse of any of the abdominal or pelvic organs may be a contributing factor if not a sole cause in some cases. Neurasthenia or hysteria is frequently the underlying cause of these neuralgias, and women are much more often affected than men.

NEURALGIAS OF THE FEET

Flatfoot and weakness of the muscles and other

NEURALGIA

structures designed to maintain the foot arch may give rise to these neuralgias. "Painful heel" is one variety. This may be due to gonorrheal infection. The patient may walk as if on eggs—very cautiously and as if trying to make himself of much lighter weight than he is. There may be no local signs of trouble such as swelling or discoloration. "Plantar neuralgia" is another form, in which the pain may be in the ends of the toes, or it may be in the ball of the great toe and simulate gout. This is also sometimes present in the foot with a hollow arch, due to great tension in the ligaments, tendons, and muscles maintaining the arch. In these neuralgias there may be unnatural sensations or sweating along with the pain.

TRAUMATIC NEURALGIAS

Direct injury to the nerves may result from a number of causes and occur in different forms, as from bruising, fracture or dislocation, incisions, punctures, from the inflammation or disease of other structures, especially bones, and from amputations. From any of these injuries neuralgias may develop. Among the most severe are those resulting from the great amount of scar tissue sometimes developing on a nerve that has been but partly severed.

TREATMENT OF NEURALGIAS

In *all* cases the direct cause of the nerve irritation must be sought, found, and removed if permanent

results are to be expected. The neuralgia can be expected to return unless there is improvement in the general health. Any particular "disease" which may be discovered—as anemia, diabetes, Bright's disease, pelvic disease, etc.,—should receive appropriate treatment. If nothing specific can be found it is pretty safe to assume that, except for those cases due solely to psychic or traumatic causes, the trouble is due to an accumulation of poisons (toxins) in the body, enervation, and anemia or poor quality of the blood. It has been said that neuralgia is the "cry of the hungry nerve." I amend that by saying hungry *nerves*, for it is not alone the nerve that is the seat of pain that is undernourished (or irritated by toxins), but the general nervous system.

Diet. When a toxic condition is present (and it generally is) the most satisfactory treatment for prompt or early relief is a fast followed either by the milk diet or a diet largely of fruits and vegetables, together with eliminative baths such as the hot tub, the steam, or the sun bath, and adequate bowel elimination. The fast may continue from five to fifteen days, depending upon the patient's weight, strength, and confidence and his daily general condition. If the milk diet is used it is usually followed until the desired results are obtained; but in case it is to be continued longer than six weeks another fast should be taken at the end of this time and then the milk begun again.

Since the citrous fruits (oranges, lemons, and grapefruit) are recognized as of considerable value in this trouble, it may be better in most cases for such fruit alone, especially oranges, to be taken instead of the

absolute fast. This makes the fast easier, and at the same time provides the blood and nerves with elements they particularly require when this disease exists, and they are also directly antagonistic to the toxins.

The elements present in green vegetables are also highly valuable in these disorders, especially when due to gout or rheumatism, and if there is any serious difficulty in adapting the milk diet to an individual's digestive and assimilative condition it would be well to take a strict vegetable diet. All the green and tuberous non-starchy vegetables possible should be used in the diet, also an occasional baked potato; but a great variety need not be taken at any one meal. Both cooked and uncooked vegetables should be used, but in preparing the cooked vegetables they should be cooked in barely sufficient water to cover them and this water, with its dissolved vegetable elements, should be served. The nerves need just those elements that are too frequently discarded down the kitchen sink or in the garbage pail.

There is a difference of opinion in regard to the value of fats in neuralgia, but personally I am of the opinion that when the digestion is not disturbed by them or when there is not some general condition in which they should be reduced, fats are of value; they provide a source of quite readily available energy and thus tend to conserve nervous energy and nerve tissue. Most people subject to neuralgia are of the type who expend nervous energy rapidly, and in some this energy is much like that of shavings or kindling wood—it burns brightly for a short time but is quickly exhausted and the reserve is soon drawn upon. Hence fats

provide the energy for immediate use and the reserve is spared. Cream, butter, and egg yolk are the valuable fats, but when the milk diet is taken ample fat is provided in the cream. Cod liver oil is of particular value, because of the contained phosphorus and vitamins so necessary for normal nerve stability.

All authorities agree that the vitamins, calcium, phosphorus, and iron are of great value in these disorders, but the medical profession attempts to supply all but the vitamins from the mineral kingdom. It is known that minerals are taken up by the body only in insignificant amounts, for the animal kingdom is designed to take up for use these elements only after they have been organized by vegetable life. Therefore such inorganic medication is inadequate. But some scientists have been able to extract from the germ and outer coverings of grains and from fruits, vegetables, and other foods just these elements. A very excellent preparation, that contains about twenty-two per cent of plant phosphorus, fourteen per cent of plant calcium, one and one-half per cent of plant iron, and the three vitamins, A, B, and C, is *Phytamin*, prepared by T. B. Wagner, of New York City. This is one of the most valuable sources of the elements of benefit in all nerve disorders. There are also other worth-while preparations more or less similar but not so rich in every element especially indicated.

Whatever the "degree of nutritional failure," this should be determined when possible. Certain it is that faulty nutrition underlies most cases of neuralgia. Anemia, gout, rheumatism and lithemia and distinct digestive troubles must be looked for and steps taken

to correct them when found. Meat should be gradually lessened in practically every case, and substituted by other protein foods—milk, cheese, nuts. But the fast and milk diet or the fruit and vegetable diet will be found of great value in every case.

Rest and Exercise. General treatment in other respects must be considered also. There must be ample rest and full sleep, for the nervous energy must be conserved. The continual “pottering around” and “busyness” of many neuralgia victims must be reduced and a mental calmness and physical relaxation cultivated. But this does not mean that one should lead a life of laziness. A happy medium should be struck and adhered to. While the painful part should receive rest until considerably relieved, an out-of-door life with plenty of general exercise is to be strongly recommended and even urged upon most of these patients. If one must work, a healthful occupation should be selected, if possible. A change of air and scenery may be of benefit in some cases, especially if the change is made to a mountainous district, from a low-lying damp and humid district. The latter atmospheric conditions should be avoided if possible. Even though colder, a higher and drier atmosphere will be of advantage,—but neuralgia can be cured *anywhere*, if the general body is properly treated. There must be as complete freedom from worry as possible.

Heat is almost invariably grateful to these patients, and this may be applied to advantage in a variety of ways—as by various hot-water applications, the hot sandbag, electric light or electric heating pad, hot air, etc. “Counter-irritation” may be considered if the

milder heat seems inadequate. Mustard plasters and turpentine stupes may be used or, in mild cases, menthol.

Hydrotherapy is one of the most valuable of our simple treatments for neuralgia, and is usually the most satisfactory means for applying heat. There are certain hydrotherapeutic measures especially helpful in particular varieties of neuralgia, though as a rule heat in some form is indicated. In general it may be said that the following applications are most serviceable:

The hot douche (at 105 degrees to 120 degrees) for from three to five minutes. This may be given by a portable hand spray outfit, with the end spray nozzle removed; or by any piece of rubber tubing that can be attached to the bathtub faucet.

The hot fan douche, given as described above but holding a thin sheet of metal against the stream at the end of the tubing, to give a flat spray effect.

Vapor baths taken seated and while covered tent-fashion with blankets (except for the head), with a steaming vessel beneath the chair, which must be open-bottomed. Usually fifteen to thirty minutes are sufficient.

Fomentations are a favorite treatment for neuralgias. The cloths should be as hot as they can be borne and changed frequently enough to keep them hot. It is best to finish this treatment (after twenty to forty minutes, or until relief) by allowing the final hot cloth to cool gradually for fifteen minutes or so (or a cold wet towel may be applied quickly over the reddened area), then dry and gently rub the part and cover

with several thicknesses of dry, soft, warm flannel. A little vaseline may be first rubbed over the surface to be covered by the cloths. Dry cloths may be applied over the fomentations, to better retain the heat. Sometimes it is preferable to apply the hot cloths over thin dry flannel, so that the heat reaches the skin gradually. It may be necessary to observe that every other part of the body except that being treated is kept thoroughly warm.

The neutral compress, at about 95 degrees to 97 degrees, is occasionally more soothing. Flannel, linen, or turkish toweling may be used.

Mustard fomentations are occasionally more valuable for the relief of severe pains. A tablespoonful of ground mustard is added to a quart of water, and after the fomentation cloths have been wrung quite dry this mustard water is sprinkled on them and they are then applied in the usual manner.

Very rarely very cold cloths or other applications will give more prompt relief. The desire for these by the patient, and their effect, must govern their use.

Electric-light baths may be given by any electric light, especially if fitted with a reflector. Any special lamp may be used. These can be procured at small cost. Office or institution treatment by mercury vapor sun lamps is frequently exceptionally valuable.

Specifically, the various neuralgias may be treated with pleasing results by the following water and light treatments:

Trifacial Neuralgia and Other Neuralgias of the Head. Hot sitz bath; hot leg bath; hot pack to legs; hot foot bath; heating wet-sheet pack—cold sheet

first, then wrapped mummy fashion in dry blankets; hot and cold compresses to the head; very hot applications to the opposite arm (in one-sided head neuralgias); fomentation to the abdomen twice a day, followed by a cold wet cloth covered with dry flannel. Applications may be made at any point that is the seat of greatest pain. Another excellent treatment is the head compress; first wet the hair thoroughly with cold water, then apply a cold wet cloth such as cheese-cloth; over this place a rubber bathing cap. This soon brings considerable heat to the head, because of the reaction from the cold application. This should be applied at night and in the morning when it is removed the hair is again soaked with cold water and then rubbed dry. A thin cap should be worn during the day for protection.

Cervico-Occipital Neuralgia. Fomentations; revulsive compresses—very hot applications for four or five minutes, followed by cold applications for twenty to thirty seconds, the change made a number of times; hot spinal douche; hot and cold spinal packs; vapor bath followed by a dry-blanket pack; hot sponging to the part; electric-light bath. Besides these, massage, naprapathy or osteopathy will prove valuable in this neuralgia.

Cervico-Brachial Neuralgia. The same hydro-pathic measures as advised for the preceding neuralgia will prove helpful here, though the fomentations should be carried farther down the spine (to the middle of the back) and over the seat of pain. The entire arm and shoulder may be heated by dry heat (baking, as in an oven or special apparatus) or, by

placing in a hot-water bath; or the heating compress may be used—cold wet cloths covered with several thicknesses of dry flannel and an impervious material over all.

Laryngeal Neuralgia. Fomentations about the neck, with a cold turban about the head or a hot foot bath at the same time; mustard fomentation to the spine—lower half of neck and about eight or ten inches down from this; revulsive compresses to this same region; hot leg bath; hot leg packs; electric light both to upper spine and throat.

Intercostal Neuralgia. Hot spinal sponging; hot fomentations over seat of pain—keep the final hot cloth on until it is of body temperature, then remove and dry and gently rub the part and cover with dry flannel; hot mustard fomentations; revulsive compresses; vapor baths; hot douche to spine; sweating bath, with gradual cooling or quick cooling and warm dry covers; hot trunk pack; heating trunk pack—cold wet cloth covered with dry flannels; electric-light baths. Here also spinal manipulative treatments may be of especial value.

Spinal Neuralgia. Hot and cold compresses; fomentations; hot trunk pack; heating compresses—thick moist linen covered with dry flannel, either with or without a waterproof material over it; vapor bath; electric-light bath. Massage should be considered, and gentle spinal manipulation as soon as possible, also slow spinal stretching.

Breast Neuralgia. Fomentations or revulsive compresses to the chest; neutral compresses—95 degrees to 97 degrees; hot sitz bath; hot leg bath; hot

leg packs; hot enema; hot vaginal douche; heating pelvic girdle; electric-light bath to breast, chest, and upper half of spine. Slowly lifting the breast by smooth-fitting cloths and stretching it upward for half a minute two or three times gives relief. This may be repeated several times each day.

Lumbar Neuralgia. Hot douche to lumbar spine; fomentations; hot and cold compresses; hot sitz bath; hot half-bath (water up to the navel, legs extended); heating lumbar girdle; hot trunk pack; electric light; massage and spinal manipulation and slow stretching of the spine.

Crural and Sciatic Neuralgia. The above treatments, also *hot* fomentations or mustard fomentations over seat of pain; revulsive compresses—long hot and short cold applications; sweating bath—vapor or heating blanket pack; electric light bath; massage and spinal manipulations.

Testicular Neuralgia (also neuralgias of the spermatic cord, bladder, ovary, fallopian tube, and uterus). Very hot sitz bath—beginning at about 100 or 102 degrees and rapidly increasing the temperature up to about 120 degrees; this is continued from three to eight minutes, while the feet are also in a hot foot bath; revulsive sitz bath—three- to six-minute hot sitz followed by twenty to thirty seconds in a cold sitz, or followed by a quick cold pouring over the hips from a pail while a cold turban is about the head; hot and cold pelvic packs; hot pelvic pack followed by cold friction by wet mitten or wet coarse towel; hot enema; hot vaginal irrigation; revulsive compresses over painful areas; hot genito-urinary douche—to the

feet, then to the lower spine (lumbar region), then to the inner surface of the thighs, then to the breasts (in women) and to the lower half of abdomen; full stream applied to feet and spine, a fan douche to the other regions. There should be no "sex life" until the condition is corrected. A well-fitting suspensory may give much relief in case of neuralgia of the testicle or spermatic cord; the sack of the suspensory should be wrung from cold water each morning when applied, or if the cold aggravates the pain, use hot water.

Coccydynia. Hot sitz bath; hot sitting bath (water just covering thighs); hot half bath; revulsive sitz; hot douche described immediately above; neutral sitz; revulsive compresses; hot pelvic pack; hot enema; hot vaginal douche. Direct manipulation of the coccyx bone by an osteopathic or other physician may give great relief—but operation should be avoided.

Rectal Neuralgia. Hot sitz bath; hot sitting bath; hot genito-urinary douche (see Testicular Neuralgia); hot enema; hot rectal irrigation (water flowing in and out constantly); hot vaginal douche or irrigation; hot pelvic pack. The fast may be especially valuable in this variety of neuralgia.

Visceral Neuralgia (including neuralgia of the diaphragm, gastralgia and enteralgia). Very hot fomentations over abdomen; hot trunk pack; revulsive compress over the abdomen for fifteen to thirty minutes as often as required; hot leg pack; heating compress; hot enema; large quantities of water internally, hot in case of gastralgia. In hysteria these neuralgias are usually relieved by the revulsive compresses alone—several minutes for the hot, half a minute or less for

the cold, repeated. The fast is necessary in case of gastralgia and enteralgia, and the milk diet is advisable after the fast.

Plantar Neuralgia (of the feet). The hot foot bath (112 degrees to 125 degrees) several times a day, for half an hour or so each time; or baking; electric-light bath. Manipulations may be necessary and properly fitting shoes should be secured.

Large amounts of water should be taken internally in all cases and especially when there is toxemia. If there is anemia the cool bath will be advisable, but it may be necessary to cover the painful area with a hot compress during the cool bath or to have the patient standing in three or four inches of hot water before the bath is given. The temperature of the general bath water should be lowered every two or three days, and the friction during the bath and while drying should be ample to insure full reaction to warmth. The body covering should be sufficient to maintain warmth during cool and cold weather.

Traumatic Neuritis may be somewhat relieved by hot applications, but direct correction of the injury will be necessary. This can sometimes be accomplished by manipulations, but surgery may be required.

Massage has proven of greater benefit than any other factor of treatment in some cases, especially in chronic and mild cases; but it is of value in the more severe ones also, though it may be unwise to use it in many cases of acute or severe paroxysms or promiscuously in any case. Especially when the nerves can be reached quite directly massage will have a

beneficial effect. Ordinarily, in the more severe forms it should be used between the paroxysms, upon which it will have the effect of reducing their severity and also of lengthening the intervals. Scientifically applied massage is preferable, but any kind of rubbing and gentle kneading will be better than none at all. It should not be expected that massage will have a markedly favorable effect upon those neuralgias resulting from a mechanical pressure upon the nerves when this pressure cannot be removed, or from nerve degeneration; but even in these cases massage may be a helpful adjunct to other treatment.

Spinal Manipulation may be considered for most cases of neuralgias and should certainly be used in many of them, but unless one has made a study of some of these methods it would be much more hazardous to attempt treatment by them than by massage when scientific massage is not understood. Among the most valuable spinal manipulative systems are naprapathy and osteopathy, though mechanotherapy, Swedish manual, and chiropractic may be of considerable value in many neuralgias. All these treatments, perhaps with the exception of physcultopathy, should be secured by a practitioner who understands his system and who has had experience in treating more or less similar cases—also one who understands the entire body and can adjust every curative factor to suit the individual as a whole.

Electricity. Some forms of electricity may be used to advantage. Galvanism with mild currents is frequently useful, but perhaps the best form is the d'Arsonnal rapidly interrupted current or Leduc's

modification of this. The vacuum electrode of the high frequency machine is also very helpful, and may be applied even by the home outfit. Most electrical treatments, however, should be given by a well-trained electrotherapeutist.

Psychotherapy is absolutely necessary in those cases resulting from psychogenic causes. It is as foolish to deny phychoanalytic therapy and psychotherapy to these cases as it is to deny diet and physical measures to those resulting from more physical causes. The cases that are stubborn and severe, regardless of their main and specific causes, should have psychotherapy in addition to physical measures.

In trifacial neuralgia the head should be carefully examined, and any specific causative condition of the cavities or sinuses corrected, if possible. It is a great mistake, however, to extract sound teeth merely upon someone's advice. Defective teeth should be treated and those beyond repair or successful treatment should be extracted. But preserve every tooth that can safely be preserved. Give them all good care and consult the dentist frequently if in doubt about any of them. The fomentations to the neck and face during the attacks and the general treatment advised, at all times, will usually greatly reduce the severity of these neuralgias.

CHAPTER XI

Neuritis and Multiple Neuritis

NEURITIS may give symptoms much like those of neuralgia, but neuritis is inflammation of a nerve trunk or its branches, while neuralgia is pain in a nerve—and, usually, specifically used to denote pains without inflammation. Pain is not the only symptom of neuritis, for the inflammation may be of a motor nerve, when there will be disturbances of the action of the muscles supplied by the affected nerves, or it may be disturbances of the involved special sense.

MONONEURITIS

Causes. Simple neuritis or mononeuritis (also called “localized” or “isolated” neuritis) may be due to a blow or other direct injury, or pressure from fractured bones or dislocated joints, pressure of tumors or scars or callus, or of crutches in the armpit, exposure to cold, local inflammation of adjacent tissues, as a result of certain diseases or from various poisons, either from within the body or from without. Injections, or the needle used for injections, frequently cause nerve inflammation. Mononeuritis usually affects only certain nerves, as of the arm or a lower extremity. There are acute and chronic neuritis, and many times an acute case becomes chronic. When several of the nerves are affected at one time it is called multiple neuritis or polyneuritis.

Hardening of the arteries (arteriosclerosis), rheumatism, gout, kidney affections, diabetes, syphilis, and especially the excessive use of alcohol all predispose to neuritis and make it possible for even slight exposure or injury to result in typical nerve inflammation.

Symptoms of Acute Neuritis. Pain along the nerve trunk or in its branches is the chief symptom, and varies greatly in degree and extent. The nerve is sensitive to pressure and may be considerably swollen. The pain is usually burning in character, but may be described as boring, darting, or piercing, and it frequently shoots through the nerve. A peculiarity of the trouble is that it is usually worse at night. Movement aggravates the pain, when movement is possible. There may be tingling sensations in the parts involved, or numbness, and fever and rapid pulse are not uncommon. There may be extreme muscular weakness and tremors, and occasionally paralysis, and frequently in severe cases there is loss of sensation and wasting of the muscles. The reflexes are affected—lessened or lost. Not infrequently an “ascending neuritis” will travel up an individual nerve trunk until it reaches the nerve plexus giving rise to that nerve, and from this plexus several nerve trunks may become inflamed. Shingles may follow the nerve course. The skin sometimes becomes glossy.

Symptoms of Chronic Neuritis. The symptoms are much the same, though the pain may be less severe. Loss of sensation or altered sensation is common, and the muscles may be somewhat or completely paralyzed and considerably atrophied, or they may be contracted. The nails become thicker than normal, and brittle.

Unless there is a toxic condition, such as in rheumatism or gout, the trouble may subside within a few weeks. When due to exposure and slight injury the inflammation can usually be reduced quite readily, unless a severe toxemia exists. Some cases may require persistent treatment for many weeks; and if the condition has been neglected or aggravated by wrong treatment or attempted use of the part, several months of treatment may be required. If there has been destruction of the nerves much depends upon whether they can be regenerated, as to whether the wasting and paralysis can be overcome. The nerves frequently do regenerate.

Treatment. As may be judged by some of the causes, there are some cases of neuritis that may require surgical means for correction, such as those due to compression by fractured and dislocated bones, callus, or scar formations, direct division of the nerve, and nerve tumors or tumor pressure. But most cases will not require this radical treatment. Whatever the cause may be this should be removed when possible, if determined by careful searching and analysis, or any treatment will be haphazard and only slowly, if at all, corrective. In any case the patient's general condition must be treated or any treatment will fail to produce the desired results.

The part affected must be put at complete rest, in acute neuritis, either by the patient remaining in bed or by some suitable splint, sling, or bandaging. The removal of any toxic condition will do much toward correcting most cases, as the majority are due largely to general toxemia, or at least are made possible by

such a condition. Sweating baths will be of considerable benefit in reducing the general toxemia, and may be given by any preferred or convenient method—the electric cabinet bath being best, but an effective treatment being given by the dry hot-air bath taken, for home treatment, while wrapped tent-fashion in blankets and seated on a chair beneath which is a protected heating apparatus, either a lamp, gas attachment, or electric lights. Or the heat from some such an arrangement may be directed, by suitable piping, to the patient while in bed. The heating pack or the blanket- or wet-sheet pack may be used, but dry heat is preferable. After the sweating bath some kind of a cold bath may be given, regulated to the patient's general condition and reactive ability. The selection may be from the friction bath—cold wet-hand, cold mitten, cold towel, or wet-sheet friction—or by the cold sponge or spray or douche. The sweating bath should be given two or three times a week unless the patient is very anemic and exhausted, in which case this treatment may be given only once a week or when strength permits.

In order that there may be as rapid recuperation as possible, as nothing reduces nervous energy more rapidly than pain and the loss of sleep it causes, the pain must be relieved, the rest of the part having considerable effect in this direction. While extreme cases may temporarily require some pain-deadening remedy, most cases can dispense with such by suitable general and local treatment. Those measures given below for reducing the inflammation will also have a favorable effect upon the pain, both directly by their soothing and nerve-quieting effects and indirectly by their

reducing effect upon the inflammation. Other pain-reducing measures are light baths, baking by hot air, and the hot percussion douche, to be followed by the fan douche of which the temperature is gradually lowered to 75 degrees or 80 degrees. Cold wet cloths covered with dry flannel and oilcloth or other impervious material over all (the heating compress) are excellent, as, also, is a dry pack for maintaining warmth of the part.

The congestion and inflammation must be reduced for the relief to be permanent. Revulsive compresses (hot compresses for several minutes, cold for several seconds) over the affected part are usually very soothing and help much to reduce the inflammation in the nerve. They may be given several times a day, each treatment to last fifteen to twenty minutes, and between these treatments the heating compress may be used (hot cloths covered with dry flannel with or without an impervious substance over all). Some cases will prefer the alternate hot and cold compresses (the hot and cold applications of approximately equal duration). Cold directly to the part is frequently much more soothing, and may be applied by the ice bag over a wet or thin dry cloth or by the cold cloths alone.

Very frequently the pain will be greatly relieved by some bath or other treatment that draws the blood to some other part of the body. This is especially true if the part is swollen or congested and throbbing. Much depends upon which part is affected as to what treatment will be given for this shifting of the blood. Short cold or longer hot applications or baths, as seem most serviceable for any individual case, may be used to

distant parts—sitz baths, packs, compresses, percussion douches (with hose attached to the bathtub faucet).

After the acute severity of the pain has subsided gentle massage will be of benefit, and still later carefully graduated exercises should be taken. If any particular exercise movements bring on or aggravate the pain these should be avoided until they no longer have this effect, except in the case of re-awakening of formerly paralyzed muscles; in this instance some mild degree of pain may be ignored, for the exercise will be more beneficial than the pain or nerve condition causing the pain will be harmful. Stretching all the joints of the body is very helpful during convalescence. Put each joint through all possible movements, carrying each movement to the limit, but make all these movements very gentle at first. Walking should be indulged in to the fullest extent possible.

For the paralysis, massage will be of benefit and should be employed daily except in the paralysis of acute neuritis while pain is still severe. Passive exercise may be employed also, and electricity may be considered, especially the galvanic current. Helpful water treatments for this symptom are alternate hot and cold compresses, of equal duration, and the long hot and short cold percussion douche to the affected regions and the spine, especially that region of the spine controlling the affected muscles.

As for diet, a fast should be instituted at the very beginning of treatment, unless the condition is positively determined as due to injury or compression. And even in these cases the fast will aid in reducing inflammation, for this phenomenon is very largely

governed by the amount of toxemia present in the body—and who is free from some degree of toxemia! The fast is to be continued, if possible, until the more acute symptoms have subsided, usually for from one to two weeks. If there is great weakness and the patient is afraid to fast, a little orange juice or vegetable broth may be given occasionally, but nothing else except considerable water. An enema should be taken daily.

After the fast the milk diet may be followed until the desired results are secured, although some cases may need to take a second fast after a month or six weeks on the milk; and a day or two on nothing but oranges every two or three weeks is always of advantage. From one to three or four oranges may be taken daily with the milk, especially if raw milk is not used.

If for any reason this full milk diet cannot be taken, a combination diet of milk and fruit for two meals and one meal of vegetables, whole-wheat bread, cottage cheese and stewed dessert may be substituted. Always there must be an abundance of water, fruits, and the green vegetables particularly.

Nude sun baths are to be taken whenever possible, and nude air baths, fresh air, and plenty of sleep are all important at all times. Some of the systems of spinal manipulation are of considerable value, especially as later treatment; but many acute cases may also be relieved by such treatment.

This disease usually takes considerable time to correct, but complete recovery can usually be established when there is no incorrigible mechanical cause. If surgery *must* be resorted to, then prepare for it by a de-toxicating regimen beforehand, and keep the body

clean inside, especially, but also outside, and the surgical treatment will be much more apt to be of permanent benefit and massive scar tissue and other harmful results of surgery will be much less likely to develop.

MULTIPLE NEURITIS OR POLYNEURITIS

In this type of neuritis many of the nerves are inflamed at the same time, or rapidly one after another. It usually affects corresponding nerves on the two sides, and most often develops between twenty-five and fifty years of age, rarely in children or later than the sixtieth year.

Causes. Always this affection results from a toxin-laden blood, though the types of toxin are numerous. These may be: (1) those toxins supplied from outside the body—"in the order of their importance being alcohol, lead, arsenic, copper, silver, mineral phosphorus, mercury, carbonic-oxide gas, bisulphide of carbon, and nitrobenzol," also potassium cyanide and aniline products; (2) autotoxins generated within the body—in the conditions causing beri-beri, gout, rheumatism, diabetes, tuberculosis, leprosy, cancer, and syphilis; (3) toxins from "infectious diseases"—diphtheria (especially), influenza, typhoid, pneumonia, smallpox, measles, scarlet fever, malaria, gonorrhea, following childbirth, septicemias, erysipelas, whooping cough, and cholera. However, no single cause is responsible for most cases of multiple neuritis; as in other diseases, the cause is largely general.

Symptoms. The extremities are more often af-

fect, and the trouble usually begins toward the end of the extremities or nerves affected and travels upward toward the nerve trunk. The temperature may be elevated early or throughout the affliction, or it may be normal. The onset is usually gradual, but may start suddenly with a chill, fever, and headache. The first sensations are usually numbness and tingling in the hands or feet (especially the latter) with quick sharp pains uncertain as to definite location. The muscles of the affected parts become progressively weaker until power may be entirely lost, and the pains become more and more severe and are usually of a burning character. The affected muscles become flabby and gradually waste away. Tremors are common and tendon reflexes are reduced or lost. The nerves are extremely tender along their course, and the muscles are similarly affected. In extreme cases there may be practically a complete involvement of all the nerves of the extremities. Among the effects may be "foot-drop," where the toes point toward the floor when the foot is held unsupported from the floor, "wrist-drop," where the hand hangs loosely from the wrist, and claw-hand. The feet are usually most often and most severely affected, and the upper extremities may not be affected at all, or to a much less severe degree. The nerves to the muscles of the face or of the tongue or of the eyes may be affected in severe cases, also the heart or respiratory muscles.

As may be expected, some cases are mild, with few nerves affected and only mildly, and the trouble may exist in any degree and extent, from this to practically every nerve in the body.

As a result of the toxemia, there may be present in any of the more severe cases certain mental symptoms, as delirium, wakefulness, or inability to talk so as to be understood. One peculiarity in some instances is memory disturbance—in which long past events are considered as of recent occurrence.

Certain causes produce somewhat different symptoms, but in the main the treatment will be the same, so the varieties, in regard to causes, need not be given much special attention. In neuritis due to *alcohol* (by far the most frequent single cause), the lower extremities are usually most severely affected. The eyes are more frequently affected from this cause than from any other, also the memory disturbance and other mental symptoms. Discontinuance of the alcohol usually results in quite prompt relief—until alcohol is again used. In neuritis from *lead poisoning* the upper extremities are most often affected, and wrist-drop with arm-muscle atrophy occurs more from this cause than from any other. Pain is not so frequent in these cases. As a result of *diphtheria*, but developing some weeks after the disease has apparently left the patient, the facial nerves and muscles may become involved, and there may be paralysis of these muscles and those of the eyes.

In all cases the nerves may eventually lose all sensitiveness. In long-standing cases where the legs are affected the legs may be bent on the thighs and almost immovable—a condition of pitiable helplessness. But early proper treatment will prevent the more extreme symptoms.

The more the condition of the patient has been weak-

ened by previous illness or other cause the more serious the neuritis becomes and the less favorable the outlook for a quick and complete recovery. Ordinarily a case of neuritis will reach its severest degree within a few weeks (sometimes a few months), at which point it remains more or less stationary for a like period of time, and then improvement begins and may continue to complete recovery. The extent of nerve involvement and the degree of nerve degeneration, also the condition of the patient and the treatment used, determine largely the time to be required in the recovery as well as the extent of recovery.

Treatment. As in many other disorders of the body, the cause should be discovered if possible, and this removed. Rest in bed and as rapid elimination as possible of the toxemia are of primary importance. A neutral bath (95 degrees to 98 degrees) for one or two hours is excellent to reduce the toxemia, or any form of sweating treatment within the strength of the patient may be used, such as the general heating pack. A quick but not vigorous cold wet-hand or cold-mitten friction bath may follow any sweating bath with advantage to the patient except in the most severe acute stages, but the body should be kept warm after such a bath. The dietetic treatment advised for mononeuritis should be adopted at once for polyneuritis, and the fast should continue as long as the strength of the patient will permit. In some cases, especially when the neuritis is associated with or the result of beriberi, it will be better to give the patient concentrated vegetable broths instead of water only, but always an abundance of water should be taken internally and

the bowels must be cleansed regularly by the enema.

For the inflammation, revulsive (long hot and short cold) compresses should be applied locally, these to be followed by a heating compress (dry flannel and oil-cloth over a cold wet cloth). The heating compress will be of service also when following fomentations or electric-light heat to the spine. A hot leg bath, a hot foot bath or hot leg pack should be used when the lower extremity is affected, and the same form of treatment to the arm when this extremity is involved. Begin the foot or leg (or hand or arm) bath at a temperature of 102 degrees to 104 degrees, gradually increased within two or three minutes to 105 degrees to 122 degrees, the bath to last for from five to thirty minutes. After a very hot local bath the part should receive a quick dash of cold water—by pouring or spray. Sometimes flannels wrung out of hot water and renewed every two hours will give relief.

Massage and exercise may be used to hasten improvement after the acute symptoms have subsided, and should be used, together with special manipulative treatment, in cases of paralysis. The patient should spend as much time as possible in the fresh air, but well protected in cool and inclement weather. The nude sun bath should be taken daily when weather and the patient's condition will permit, but the exposures must be short at first and gradually lengthened as the skin becomes accustomed to the sun's rays.

There is no drug that will in any way ward off an attack of neuritis or shorten the course of the inflammation; but the application of adequate natural

eliminative measures and those for reducing the inflammation, and later ample nutrition with foods rich in the neutralizing, normalizing mineral elements and the vitamins, will in practically every case be rewarded with complete recovery.

CHAPTER XII

Sciatica

SCIATICA is a neuritis, such as was described in the preceding chapter under "mononeuritis," but as it is quite frequently met with it deserves a separate chapter. It is, specifically, a neuritis of the great sciatic nerve (the largest nerve in the body), which passes from the spinal cord by way of the sacral plexus, to supply the skin of the leg, the muscles of the back of the thigh, and many of the muscles of the leg and foot. The term is quite loosely applied, many times to include pains in the same region of various kinds and from various causes, though it is correctly applied also to a neuralgia of the sciatic nerve.

Causes. This painful condition is found more frequently in men, the usual age being at or after middle life, the attacks usually coming on during the late fall and winter and during changes to cold or damp weather.

All occupations that are associated with considerable exposure or strain may lead to the disorder, especially in those individuals who are "gouty" or "rheumatic"—and who have the necessary toxemia, also enervation. The factors that may lead immediately to sciatica include constipation, autointoxication, the intoxication that gives rise to gout, rheumatics, and diabetes, alcoholism, pressure from wrong posture or hard seats—as in the cases of stenographers, bookkeepers, clerks, locomotive and stationary engineers—great muscular strain from heavy labors, lumbago, and the various disorders

that affect the pelvis— congestions, inflammations and tumors of the prostate or of the female pelvic organs. Injuries of the spine or hip-joint, injuries to the pelvis of women during difficult childbirth, syphilis, and tuberculosis may all give rise to sciatica. In practically all cases, regardless of what the exciting cause may be, there is an unstable and weakened nerve system, and a generally toxic and enervated condition is usually the leading predisposing cause. Sometimes, however, contractions of the spinal muscles and ligaments or a subluxation of the vertebræ may result directly from direct injury, strain, or general or adjacent nerve irritation, and sciatica may be the chief symptom.

Symptoms. An acute attack usually comes on suddenly with severe pain and tenderness in the hip region, upper thigh, or along the entire course of the sciatic nerve. Occasionally there are paroxysms of extreme pain, which in character may be burning, boring, stabbing, or tearing; sometimes there is merely a dull ache which change of position relieves very little if at all. Whatever the character of the pain, it is frequently more pronounced at night. Sometimes there is occasional freedom from pain alternating with attacks of most extreme severity. The pain shooting from above downward may give rise to a sensation of an actual shock as it reaches the heel. In addition to the pain, the patient may feel a sense of numbness and tingling, with a sense of weight and coldness in the affected leg. All along the pathway of the inflamed nerve there will be found points of unusual tenderness, especially at the hip, behind the knee, in the middle of the calf, and near the heel. In severe cases there may be a loss or reduc-

tion of sensation. In chronic cases the muscles of the hip and of the thigh may become somewhat atrophied, and a condition similar to shingles may develop along the nerve course. In addition, the neuritic limb will generally have a lower temperature than the normal one.

As any movement of the body that revolves around the lower back will increase the pain, the sufferer usually holds himself in a constrained position. As the pain is generally on one side, the position the patient assumes is one of leaning slightly toward the normal side, to keep the weight off the affected extremity, which in time makes a spinal curvature in the lumbar region, with the concavity toward the affected side; and the slight forward bending of the body, to reduce the nerve tension, in time takes out the normal forward curve of this region.

The duration of this disorder varies, and may be from a few days to several weeks or months; obstinate cases may persist for a year or even longer.

Treatment. As advised for all other forms of neuritis, so here also the first essential is rest. The patient should be put to bed, and if necessary for complete rest of the part a suitable splint may be applied the full length of the extremity or sand-bags or salt-bags may be extended along the sides of the thigh. The cause should be searched for, and if found, removed or rendered as impotent for harm as possible. Free evacuation of the bowels should be accomplished promptly, to drain the pelvic veins.

Hydrotherapy is one of our best means of giving early relief, and also of reducing inflammation in many

cases. A great relief may be had through the application of the prolonged heating leg pack after continuing fomentations for fifteen to twenty minutes. The pack is applied by closely wrapping the affected leg in a cold wet sheet and covering snugly with a dry blanket. If it is necessary to stimulate the circulation, the leg may be rubbed outside the wrappings. If cold is not agreeable a hot-blanket pack may be used instead of the cold sheet. Mustard fomentations are frequently of greater benefit than ordinary fomentations.

Revulsive compresses are also of great value in some instances; these consist of very hot fomentations for fifteen or twenty minutes followed by a well-wrung, very cold compress for from thirty to forty-five seconds, or by cold friction for this length of time. The heat and cold (or friction) may be repeated once or twice.

The Scotch douche is one of the most effective of all water treatments for the relief of sciatica. This may be given with some degree of effectiveness in a home provided with ordinary bathroom and tub, by means of a hose attached to the faucet. The fan douche (described in Chapter X), should be applied with moderate force at a temperature of 120 degrees to 130 degrees, or as hot as can be borne, over the lower part of the back and along the track of the affected nerve. The hot application should continue for four or five minutes, and be immediately followed by a very cold jet (50 degrees to 60 degrees), broken when the skin is sensitive, or the fan douche, for from six to ten seconds. The portable hand spray is excellent

for applying both the heat and cold. A tub bath at 95 degrees, remained in for several hours, is sometimes of great value. For the first few minutes the body should be frictioned thoroughly by attendant or nurse, but after that time the patient should not be disturbed. The water should be kept at a uniform temperature by letting out some of it occasionally and adding more at the required temperature. A hot sitting bath (legs at full length) will be of value but must be avoided in acute pelvic inflammations.

The electric therapeutic lamp is often very helpful, and may be used until perspiration is brought out over the affected area. This part may then be quickly but gently rubbed with a well-wrung cold cloth. Diathermia and the galvanic current are valuable forms of electricity, but cannot be home-applied. Massage may be employed when the skin is not hypersensitive and after the more severe nerve pains have subsided.

In addition to the rest and local applications, constitutional treatment is very necessary. A fast should be taken for the duration of the more acute pain and should be followed by the milk diet unless the sciatica is clearly due to rheumatism, in which case a diet consisting largely of fruits and vegetables is preferable. The fast may need to be repeated in some cases, after weight has been regained from the first fast. After the acute pain has been relieved passive exercise may be given to the leg or legs by various bending and twisting movements; these may be given in connection with massage. After still further improvement, active resistive exercises may be begun gradually, and in time general active exercises may be taken.

If the spine or spinal muscles and ligaments or sacroiliac joint be at fault, adjustments or other suitable spinal manipulation will be necessary. If rheumatism, gout, tumor, or pelvic disorder is the cause, special attention must be given to that malady. Nerve stretching cannot be recommended. Strict adherence to the regimen outlined will almost invariably bring improvement or cure within a few days or weeks.

CHAPTER XIII

Headache and Migraine

HEADACHE is so universal that it should not be necessary to define it. Almost everyone has had some of the various kinds and degrees of head pains. However, headache is usually defined as a diffuse pain or ache affecting much of the head at once or a considerable region of it, but not confined to the area supplied by any one nerve. Here, as in so many other conditions, we are dealing not with a disease but with a symptom, and one of the most common of nervous symptoms. It is claimed that fifteen per cent of children of the school age, twenty-five per cent of men, and over fifty per cent of women are victims of headaches in more or less severe degree.

Since headache forms such an important part of the symptom complex of so many disorders—since it is due to so many causes and requires so many different forms of treatment, depending upon the cause—justice can scarcely be done the subject in the space of a chapter. Indeed, I have recently published a book devoted entirely to the subject of headache and migraine or sick headache.

Briefly, among the causes of headache may be mentioned: (1). Various toxemias—from constipation and disorders of the digestive tract, of the kidneys and liver; of metabolic disturbances, as in rheumatism, gout, diabetes and goitre; and of “infectious diseases”; from various drugs, including coffee, tea, alcohol, and

tobacco, and those come in contact with in occupations. (2). Disturbances of the circulation and blood vessels—as in anemias of different kinds, hyperemias, or congestions, and arteriosclerosis or hardening of the arteries. (3). Nervous disorders—as neurasthenia, hysteria, neuralgias, epilepsy, mental overexertion, and emotions. (4). In association with various local disorders—of the eyes, ears, nose, throat, sinuses, and teeth. (5). Reflex—from eye and nose condition or from certain disorders of the digestive or sexual organs. (6). Organic change in some structures within the brain or cranium—apoplexy, tumor, abscess, compression, brain softening, and blood-vessel diseases.

Symptoms. Judging by the many causes, the headache may be expected to vary in location, extent, degree, and frequency. The pain may be general or wide-spread, though when not general it is classified according to its situation, as frontal, occipital (at the back of the head), parietal (at the side of the head over the ears), temporal, vertical (at the very top of the head), and diffuse or scattering, and a combination of these. As to the pain itself, it may be any degree, from barely perceptible to an almost dementing agony, and in nature it may be a sensation of fullness or throbbing, burning, splitting, boring, bursting, “soreness,” numbness, etc. Sometimes the location, type, and degree of the headache may indicate somewhat the nature of the cause, but these cannot be absolutely relied upon. Usually there will be some other symptoms associated with the headache which may help determine the cause of the latter. Sometimes the headache overshadows all other symptoms, but not infrequently it is one of

the minor symptoms and may be only mildly disturbing.

It may be said that when the pain is of a throbbing character, somewhat shifting and often associated with a ringing in the ear, it is generally indicative of hardening of the arteries. The feeling that a nail is being driven into the head points strongly to hysteria. In neurasthenia there is frequently the oppressive feeling as if a band were wound around the head, usually worse in the morning and gradually passing off toward evening. Pains that arise generally in the frontal and occipital areas after reading or sewing are usually associated with eye trouble, possibly only an eyestrain.

Treatment. While much may be done to relieve headache and many times entirely remove the head pains without a knowledge of the cause, the cause must usually be determined if possible, and given appropriate treatment before the headache will be permanently reduced or cured. The first thing in almost any case, regardless of cause, is to attend to the diet and to secure adequate bowel elimination. Fasting will often give quick relief, but if there is anemia the patient may require more complete nourishment. The milk diet or an abundance of milk in a natural diet may be best in the anemic cases, and the milk diet may be used after the fast for most other conditions. Many times it is important that a very restricted diet be followed for many days or several weeks, even months, especially for some metabolic, arteriosclerotic, or congestive condition. In a great many cases the fresh fruit-green vegetable diet is quite satisfactory and all stimulants, including tea, coffee and alcohol, are to be avoided, as well as tobacco.

Most drugs prescribed for gastric and intestinal troubles, and many of those prescribed for other conditions, leave headache as an after-effect, and this is frequently brought on directly or indirectly even by some drugs given for headaches; therefore all drugs should be strictly avoided. The ice-bag applied to the head and neck is very comforting in most headaches, though those due to anemia should be given heat instead of cold, or a general circulatory stimulant, such as the blanket pack, the warm immersion bath, or hot spinal packs. The cold wet turban or wet cloths on the eyes and forehead will be excellent for congestive headaches and those due to eyestrain. Alternate hot and cold compresses over the top of the head and back of the neck, in combination with a very hot foot bath or hot foot or hot leg pack, will usually have a decidedly relieving effect; the hot packs may be wrung from very hot water and the cold packs from ice water.

It is frequently advisable to have complete quiet, in comparative darkness, and the patient is usually more comfortable while lying on the back with the head and shoulders somewhat elevated. Gentle rubbing of the forehead and sides of the head and neck are very helpful in most cases and may be given if agreeable to the patient. Neck massage may be given carefully and if it relieves the ache it may be repeated every three or four hours if the headache continues.

MIGRAINE OR SICK HEADACHE

Migraine is a nervous affection characterized by

periodic head pains. It is generally, perhaps invariably, found in persons of an unstable nerve constitution, though some physical disturbance usually gives rise to the attacks. Though this disorder is not necessarily associated with an idle life and fast living, yet patients of this class more frequently have these headaches—merely or largely as a nervous explosion or periodic overflow, though mental workers are more liable than physical laborers. Women are the victims somewhat more frequently than men, the age of its usual beginning being between ten and twenty. A family influence may be seen in offspring of neurotic parents. Worry, excesses of any kind, and uterine or ovarian or liver disorders may be the chief cause. The exciting cause may be menstrual difficulties, eyestrain, disease of the nose, throat, ears, or teeth, emotional upsetting, especially violent rage, but also grief and anxiety. Abuse of alcohol, sexual excess, and mental overexertion may act as causes of an attack after the condition is established.

Symptoms. As a rule, for a number of hours, possibly for a few days, there are preliminary feelings of irritability, restlessness, malaise, depression, moroseness, a fullness in the head, and perhaps slight dizziness. The attack itself usually comes on in the morning and increases in intensity to such degree as to force the sufferer to stop work and lie down. The pain begins, usually, in the forehead on one side, and involves the eye of that side. The temple may throb terrifically. The pain is always deep-seated. In varying lengths of time the entire side of the head may be affected, and from a mild pain or fullness increase to an “unbear-

able" degree. Flashes of light are observed frequently, and with the throbbing, blinding pain cause the patient to seek the darkness and quiet. Jars, noises, and light greatly aggravate the pain. Nausea and vomiting are commonly though not invariably present. It is these symptoms that gave rise to the term "sick headache." The face is usually pale, rarely flushed, though the two sides may be different. The pulse is generally slow. The length of the attack usually varies from six to twenty-four hours, but may continue for two or three days. It is very prone to recur and this may be periodically—every month, every fortnight, or even every week—or it may be irregular and infrequent. Women are liable to have recurrences at the menstrual epoch, but when they enter the menopause or "change of life" this tendency to recur usually passes away and they remain free from further attacks. Men are usually free, also, after the age of fifty.

Treatment. In order to prevent the development of migraine in children of nervous or neurotic parents, the children should be carefully watched in their daily life and habits of hygiene, diet, work, play, and sleep. They should not be permitted to undergo any mental or physical strain in school or elsewhere, though ordinary out-of-door physical play is to be encouraged. The diet must be wholesome without excess or deficiency and with little fat and sweets except cream and butter and sweet fruits, and there must be proper elimination from the bowels and skin. Plenty of fresh air is necessary, and a daily cool bath with friction should be given. Such children should have an abundance of sleep, but need not become "lazy." Watch carefully,

also, for any possible eye trouble. At the least sign of such the eyes should be examined and the strain corrected, but do not be too hasty to recommend eyeglasses, as eye exercises, less reading, and perhaps spinal manipulation are much better.

In the milder attacks, without vomiting, the patient may sometimes be helped by eating a small amount of food or by drinking a glass of hot unsweetened fruit juice or hot milk, but this does not cure the condition. The attacks are often aborted or lessened in severity by abstaining from all food and drinking copiously of water, with or without citrous fruit juice and unsweetened, and hot colonic flushings. This procedure helps in many cases actually to remove the cause. The cold applications to the head, as recommended for ordinary headaches, will probably be needed during the migraine attack. The patient must relax, as fully as possible. Gentle manipulation of the muscles of the neck will be soothing and to some extent relieving. The eyes may be massaged also, with considerable benefit in some cases. Fresh air is necessary.

Exercises that will develop the general bodily health and strengthen the nerves are advised for the intervals between attacks, and proper mental attitude will be necessary. The outdoor life is a factor of primary importance. This should include walking and perhaps mild running or active sports, and the nude air and sun baths. The daily cold or cool bath will be of great value. Also the real cause of the condition should always be given particular attention, if discovered, in addition to the general constitutional treatment.

CHAPTER XIV

Apoplexy or Cerebral Hemorrhage

IN the strictest sense, apoplexy, or an apoplectic stroke, denotes sudden unconsciousness with temporary loss of all motor control, the victim falling if on his feet or sitting. But frequently the term is not confined to this meaning, as it may refer to a milder attack and different symptoms. The popular conception of apoplexy is that it is invariably the result of the bursting of a blood vessel—and that always in the brain. As a matter of fact the condition results no more frequently from this cause than it does from an obstruction of a blood vessel by an embolus, a thrombus, or from a spasm of the artery itself; however, a disease of the arteries most frequently gives rise to the first two of these obstructions. Apoplexy is most commonly found in men and over eighty per cent of the cases are met with after the fortieth year, and the usual time of its appearance is especially between forty and fifty; but, because it is not necessarily due to disease of the arteries, it may be found in childhood or infancy or at any other age.

The predisposing conditions are those that cause degeneration of the arteries, as various intoxications and drugs. Heredity is supposed to have a predisposing influence, but as I have pointed out in my books on various abnormal conditions, it is usually the same mode of living that is “inherited,” and the same diseases may result from such. Mental or physical over-

exertion, lifting, acute digestive disturbance from excessive eating and drinking, and sexual indulgence are frequent immediate causes. Sudden excitement or passion, especially anger, has not infrequently produced an immediate apoplexy, as also has taking a cold bath or straining at stool when the blood vessels were already hardened to the breaking point. Whooping-cough or a convulsion brought on by digestive, ear or other trouble may bring it on in children, and especially if the arteries have been weakened by a severe attack of scarlet fever or diphtheria neglected or wrongly treated.

A thrombus is a plug that forms in a blood vessel and remains where formed. This accounts for the gradual development of the symptoms of apoplexy from this cause. Syphilis is considered the usual cause of this, but it may result from rheumatism, gout, other blood disease or chronic lead poisoning. There may be warning symptoms of dizziness, headache, and a dozy, torpid mental condition, also twitchings of the muscles and perhaps transient paralysis of the parts later affected. There may also be disturbances of speech or of reading or writing ability, blindness of half the eye, or loss of ability to distinguish objects by feeling.

An embolus is a plug that is carried by the blood stream from some other source. It may be part of a diseased vessel wall or heart valve, from a thrombus or clotted blood elsewhere, from tumors or the placenta, and from numerous other sources. Thus in inflammation of the heart valves (endocarditis), in pregnancy infections, and severe anemias there may be an embolus carried to a small brain artery, where it blocks the vessel when it can go no farther and produces,

usually, sudden one-sided paralysis and speech disturbance. It can be readily seen that embolism produces a much more sudden apoplexy than thrombosis.

Very frequently neither of these conditions exist, but the apoplexy results from hemorrhage into a limited portion of the brain. Those with arteriosclerosis are more subject to this, and any strain, mental or physical, may produce it. When there is a chronic Bright's disease there is grave danger of this termination, because the heart is enlarged and gives a stronger beat and higher blood pressure than the sclerosed vessels can safely withstand.

Primary Symptoms. The unconsciousness comes on suddenly at the time of the hemorrhage or embolism, but before this (when due to hemorrhage) there may be symptoms of cerebral congestion—headache, dizziness, insomnia, ringing in the ears—and not infrequently weakness, tingling, or numbness of the side later affected.

There may be no previous warning, the attack coming on with frightful suddenness, the patient falling unconscious. The face is flushed, the eyes congested, probably the pupils unequal in size, the lips are blue, the breathing somewhat like snoring, the pulse slow and full, the extremities cold and relaxed, the temperature first subnormal then elevated, and there is involuntary passage of urine and bowel contents. Signs of a one-sided paralysis are detected in the pulling of the head and eyes to one side, the flopping of one cheek, and a lifeless falling of the affected arm when raised and released. These are the usual signs of apoplexy, but they may be somewhat different when the hemor-

rhage occurs elsewhere than in the usual location. In severe cases consciousness will not be regained; instead, the pulse becomes progressively more feeble and the respiration seriously affected until death supervenes, or there may be less rapid decline, partial consciousness returning with some delirium and headache, with death within two to three weeks as a rule.

Later Symptoms. The majority of cases are not fatal. Sometimes the entire set of symptoms and conditions are rapidly overcome and the patient apparently none the worse for the experience, though there are of necessity the same underlying causes and a recurrence of the stroke will be almost certain if a radical change in the manner of living is not made promptly.

Usually, however, there will be some signs remaining. Within twelve to forty-eight hours the consciousness is usually regained, but there remains a paralysis of the side of the body opposite to that on which the hemorrhage occurred. The tongue is deflected to one side when protruded. There may be considerable disturbance of speech and swallowing. As recovery begins, the tongue and twisted face usually show first and greatest improvement, then the leg, and the least improvement is made in the arm. The muscles affected are usually stiff and the extremities moved with difficulty by an attendant, but there is no rapid wasting of the muscles, and sensation may be unimpaired. When walking, the gait is characteristic, the leg is swung forward by a twisting of the body and the toes scrape the ground. The shoulder is usually drawn down, the forearm partly bent, the fingers tightly shut in the palm, and this arm is usually supported by the sound

one. During the course of the disorder mental disturbances are usually noted: the memory is affected, power of attention or concentration limited, and the patient is highly irritable, sometimes cries easily and is highly emotional. Sometimes, if the damage to the brain is extensive or the body highly toxic, there is gradual development of mental weakness from structural change that may end in epilepsy or insanity.

However, in most cases that are properly treated all signs of fever and brain irritation pass away within a month or so. The leg and arm can be moved voluntarily somewhat, the mind is more clear and the headaches are relieved. All symptoms and signs may then gradually improve until complete or nearly complete recovery follows—or there may be some degree of chronic paralysis remaining from the more severe hemorrhages.

Treatment—Preventive. Detoxication treatment will lower blood pressure and save the arteries, and should be used, especially in all cases where there is a high blood pressure or where it is known that the kidneys or the blood vessels are seriously diseased. A quiet life is necessary, free from mental, emotional, and physical stress. If there is constipation this must be relieved by proper diet and enemas, or, if an attack seems imminent (by numbness or tingling of extremities, thick speech, confused mentality and headache) by a saline laxative. There should be freedom from constrictions about the body, especially about the neck. The fast and fruit-juice diet are most quickly detoxicating of all diets.

The Attack. When the person is first seized with

an apoplectic attack he should be placed in the recumbent posture with the shoulders and head slightly raised, his clothing should be loosened, a plentiful supply of fresh air provided, and cold cloths or an ice-bag over cold wet cloths applied to the head and nape of the neck. An effective enema of water at neutral temperature should be given, to clear the bowel. Hot pads to the feet or below the knees will be helpful in drawing the blood from the brain, but should not be employed if the face is pale and the pulse feeble, as is sometimes the case. These packs should be removed after thirty minutes and applied every two hours, and a dry pack should be kept on in the intervals between. Sometimes pressure upon the carotid arteries in the neck can be given, to reduce the quantity of blood sent to the brain. If there seem to be collections of mucus that interfere with or endanger breathing these should be removed after the patient is carefully turned to one side.

Subsequent Treatment. No food is given until the more acute symptoms have passed and there is a definite desire for it. Plenty of water is drunk, and the enema is given daily during the fast. The fast may be followed by the limited milk diet if the patient is normal in weight or underweight, or by a still more limited diet of solid foods if overweight. Care must be observed in breaking the fast, as this must be done very gradually. When milk is used, one pint may be given the first day, four ounces every four hours; and a glass may be added each day up to three quarts a day, the amount per feeding gradually increasing and the intervals gradually shortening—until, perhaps, by the time the three quarts are taken the feedings will be one

glass every hour, for twelve hours daily. If considerably underweight, the quantity may be increased to four quarts, but the increase beyond three quarts should not be more rapid than an additional glass every three or four days.

When the entire milk diet is not used, begin with vegetable broth two, three, or four times a day; then broth and toast; then broth, toast and plain green vegetable salads (not over three times a day). Soups, fruits, green vegetables (cooked and raw), whole-grain cereals (in small amounts), and milk are the chief items to be used in the solid-food diet, and the quantity is strictly limited until the weight is reduced to normal or until there has been a marked improvement in signs and symptoms. Overeating is always to be avoided, in any and every case.

After the fever (which is sometimes present) has subsided hot spinal compresses may be applied daily, followed by quick, cool, gentle friction. When the fever, irritation and prostration have passed and some strength is gained, massage of the entire body and manipulation of the affected parts, bending and stretching the joints, are to be adopted. If available, the sinusoidal electric current may be used on the paralyzed muscles after three or four weeks, along with the massage and manipulation or passive exercises; or the faradic current may be applied to the muscles, as often as three times a week.

After a week of massage and passive exercises, walking may be started if the reduction of paralysis will permit. Resistive or simple active exercises may be taken as soon as the muscles become capable of active

movement. A constant effort must be made to increase the use and variety and extent of movements of the affected parts.

Warm immersion baths or, preferably, neutral baths (92 degrees to 97 degrees) may be given after the acute symptoms have subsided, also cool sponge baths, and short applications of nude sun-and-air baths; and plenty of sleep and an abundance of fresh air are necessary at all times. A quiet, regular life is advisable, with strict attention to all hygienic, conservative, and health-building measures. Such a patient should never return to an active physical or mental life, particularly the latter.

CHAPTER XV

Epilepsy

EPILEPSY, or "falling sickness," is a chronic nervous disorder characterized by recurring paroxysmal attacks or seizures in which there is a temporary loss of consciousness. About one-third of the cases are found in families where there is a history of some form of nervous weakness, either epilepsy itself (though rarely), insanity, or a markedly weakened nervous constitution. The exact cause of this disease is not known except in the form due to some local brain disorder, possibly from injury to the cranium, (Jacksonian Epilepsy; in which the spasms are localized); but a toxic condition of the body together with an inherited weakness of the nervous system will make one predisposed to it. Alcoholism, syphilis, rickets, malnutrition, intestinal worms, difficult or abnormal labor, and menstrual disturbances may be causes when there is already the susceptibility. A person who lives a natural, normal life need not fear this disease, however, even if the heredity is unfavorable.

A small percentage of the cases have been analyzed as being purely psychical, in other words produced by the thought only, but unconscious thought. From the standpoint of psychoanalysis, it is claimed that epilepsy is a convulsive expression of some repressed wish or thought hidden in the subconscious mind. Sajous, one of the leading authorities on endocrinology (the science of the ductless glands—those of internal

secretion), believes that there is generally a disturbance of the adrenal glands, one of which lies atop each kidney. But this theory has not as yet been satisfactorily proven. Thyroid disturbances may be responsible, and removal of both ovaries have been known to produce the disease. Since epilepsy develops not infrequently in defective children, it is very probable that the glandular defects have some bearing on the epilepsy itself. The glands at fault in these defective cases may vary somewhat, but usually the pituitary (in the brain), the thymus, and the thyroid are involved.

Epilepsy may develop at any age, though more frequently before the twentieth year. When it is found in middle life it will usually be discovered that it existed earlier, but if it begins in later life it is usually the result of syphilis, toxemia, direct injury or brain disease, possibly brain tumor. In most cases there is brain anemia and low blood pressure. There are two main types: major epilepsy or grand mal, and minor epilepsy or petit mal.

Symptoms. The *grand mal* or major attack frequently gives some preliminary warning of its oncoming, for a few hours or a day or so, by a sense of general weakness, irritability, or giddiness. In about half the cases the attack begins with a peculiar sensation called the "aura." This may consist of a sensation of numbness or pricking or of a breeze beginning in the hand or leg and passing up to the head, at which time consciousness is lost. Infrequently there are auræ of the special senses: the patient may suddenly perceive dark spots, or perhaps a flash or a spark or a ball of light in one eye. Another may hear voices or hissing,

cracking, or roaring noises in the ear, or he may perceive peculiar tastes or odors. Some few patients have the aura a long time before the onset of the convulsion, though the usual duration is but momentary, and in many cases there will be absolutely no warning of any kind. Sometimes there is only the aura and no seizures, indicating an undeveloped form or abortive attack of epilepsy.

After the aura, if it is present, follows a peculiar piercing scream or outcry and the patient falls violently to the ground as if thrown down, and becomes completely unconscious. The face is first pale and the eyes are fixed forward, probably open. The head is drawn backward or to one side, the back may be arched, and the entire body is in a state of rigidity, the legs extended, the hands tightly closed, the jaw set. The respiration is entirely suspended and the face becomes congested and then cyanosed (deeply purple) from the lack of oxygen and the compression of the veins of the neck. This firm rigidity lasts but a few seconds, then begin alternate contraction and relaxation of the muscles in rapid succession, including the face and eyes, and the tongue may be bitten from the sudden and repeated gnashing of the teeth. There is frothing at the mouth, which is blood-stained if the tongue is bitten. The cheeks and lips flop out with each breath. Breathing begins, usually, during the jerking movements, and the face assumes a more normal color. The movements are sometimes so severe that the patient may be thrown violently about his bed or floor and he may do physical injury to his body; the onset is so sudden that there is no time for the patient to select a safe

place for the seizure. The spasm lasts one or two minutes, than gradually moderates and from the temporary exhaustion-paralysis the patient falls into a stupor from which he can be aroused only with difficulty—though there should be no attempt made to arouse him. Vomiting may occur as a last symptom. Immediately after the sleep there are mental dullness and headache, which last for the remainder of the day or for several hours. There is usually muscular soreness and lameness the next day, as a result of the violent contractions.

In some individuals the attacks occur invariably at night, and for a long time no one may be aware of their occurrence, the soreness and mental stupor being apparently unaccountable. This is called "*nocturnal epilepsy*." It differs in no wise from other major epilepsy except in the time of its appearance, and if unsuccessfully treated the attacks usually begin to appear in the daytime also.

The severe attacks of grand mal may come on only once in two or three years or once or twice a year, but gradually, as the cause of the disorder develops they become more frequent until they may occur once, twice, or more times a month. In very severe and long-standing cases the convulsions may occur daily or several times a day. This condition is called "*status epilepticus*," and when it develops death usually comes before long, from exhaustion. In mild cases the attacks are generally more frequent and may occur daily or several times daily.

Physically, the epileptic patient frequently feels better, except for the muscular soreness, for a short

period following the termination of the seizure. The appetite is very irregular, often absent in older cases, in children and youths frequently being voracious. In the majority of cases there is gradually increasing mental weakness. This is indicated by the increasing failure of memory, heightened irritability, inability to keep the mind fixed on any definite subject or to carry out any piece of work, selfishness and general change in disposition, sometimes loss of moral sense. This latter change is frequent in children, and they may show a marked tendency toward viciousness and criminality.

The *petit mal* or minor attack causes the patient to stop anything he is doing, whether it be some physical activity, reading, talking, or whatnot. His features become fixed, the face is pale, the eyes are open, often there is a slight twitching of the muscles of the face or of the arms or legs, then a momentary loss of consciousness, but the patient never falls. This unconsciousness lasts only a few seconds, but during that period the patient may whistle or hum monotonously, twirl a watch chain or fob, tap the fingers together or on a table or chair, or do some other equally purposeless thing. The face soon becomes suffused with blood, as in an intense blushing, the patient resumes consciousness and continues with his work, unaware of what occurred except that he has had a "spell."

It has been said that certain geniuses of history, as Cæsar, Alexander the Great, and Napoleon, were subject to fits of epilepsy. A careful study has led some authorities to believe that, though these men were subject to some sort of spasms, these were probably not epileptic.

As a rule, uncured patients with major epilepsy do not live beyond the age of forty or fifty, for the condition and its cause do shorten life to a certain extent, and the tendency is toward increase in severity and frequency of attacks unless treated for a long period of time by natural means. After epilepsy develops the usual length of life is about thirty years. About ten per cent of the victims show insane periods, but these periods do not as a rule last long, though they may recur more or less frequently. About five to ten per cent recover, without natural treatment. The serious form may reach a certain degree of severity and persist that way for many years. The prospect for cure of the mild attacks is considered as a rule less favorable than of the severe ones, and those developing early in life are less amendable to treatment than those developing later, though much depends upon the patient's vitality and mental attitude, the nature of the treatment and the adherence to the treatment. The demented cases are incurable.

Treatment. When an attack is threatened (if this can be determined), give an enema of two quarts of moderately cool water, slowly injected, while in the knee position. Large quantities of water should be drunk. There should be rest in bed, and an ice-cap may be applied to the head, or a folded cloth saturated with cold water. The hand or foot may be placed in cold water if the aura starts here, as a tingling, a feeling of air-waves, etc., and this may serve to abort an attack.

There is not a great deal to do when the attack comes on but to endeavor to keep the patient from doing him-

self bodily injury. It is better that he be placed on the floor, but if he is on a bed or couch see that he does not fall off. A pillow should be placed under his head, and his collar or shirt should be opened at the neck. Something fairly soft, as a folded towel should be placed between his teeth, but the attendant must use care to keep the jaws from closing on his own fingers.

After an attack there should be ample rest, followed by some tonic cold bath, as friction by the cold wet towel or mitt. The proper method of applying the cold mitt friction is as follows: The patient, undressed, lies on a bed or couch wrapped in a Turkish sheet. The head, face, and neck are wet with cold water. The attendant dips a heavy, closely woven woolen mitt in cold water and rubs a small uncovered area of the patient's body until it is red, then this part is dried and re-covered. Gradually the entire body is bathed in this manner, alternately bathing and drying as reaction sets in. The cold-towel rub is applied in about the same manner, but instead of a mitt a Turkish towel is used. In either case it is important that the rubbing continue until the skin is well reddened by the reaction.

As to feeding, in the treatment of the condition between attacks, epileptics should have just enough food to meet the demands of the body. If there is an erring as to quantity, it should be on the side of undernourishment rather than of overnourishment. The best results are obtained from a diet consisting mainly of fruits, vegetables, cereals, milk, butter, cottage cheese, and honey for sweetening or a small amount of sweet fruits occasionally. Eggs should be omitted or used very moderately. No meat should be permitted or, if

given, only a very small portion at the midday meal and by no means daily. All stimulants, as tea, coffee, and alcohol, are prohibited, as well as all drugs, also such things as smoked and pickled foods, refined foods, and condiments.

A fast or diet of nothing but acid fruit for from five to seven days is excellent at the start of treatment, and this may be repeated for from three to five days every six to eight weeks. During this fast or fruit diet the bowels should be cleansed daily with an enema, and plenty of water is drunk. The fast is broken gradually, using the foods just mentioned, but having the quantity low at each meal and the variety as simple as possible—from one to three articles at a meal being preferable to large combinations. The milk diet may be used if the patient is underweight or if there is much disturbance of digestion, but it must be limited to four quarts daily, or even less in many cases. From one to three oranges may be taken daily, but preferably before starting the milk in the morning and after discontinuing it at night. If any difficulty is experienced in digesting the milk, particularly if there is much gas or any other trouble in the stomach, it will be much better to avoid milk as a complete diet and use solid food, providing this can be made to agree better. At any time and on any diet, overeating in any form must be strictly avoided, and the fast should be instituted when such digestive troubles from any cause aggravate the attacks, either to make them more frequent or more severe. In most epileptic patients the condition of the digestion has a great deal to do with the frequency and severity of the attacks.

Occasional colon flushing with ordinary table salt and water is advisable, even if bowel elimination seems quite satisfactory.

The second problem is that of increasing the tone of the vasomotor apparatus—the nerves that control the blood vessels—and of steadying the general circulation. Water is here the main agency. The patient should take a prolonged neutral tub bath (at 95 degrees to 97 degrees) daily or three times a week, especially in the more severe cases. This bath may be continued for an hour or two or up to ten or twelve hours, and should be followed by a short, moderately cold application with friction and thorough drying. A hot-air bath may be taken from three to seven times a week, and the sun bath thrice a week will be excellent, but in either of these two baths the head must be protected from extreme heat, and a cool or quick, moderately cold bath should follow. At least two quarts of water should be taken daily unless the patient is on the milk diet.

Air baths, dry friction baths, and sun baths are all of much value. If nude sun baths can be secured daily, fewer neutral tub baths will be required. The cold-mitten friction may be taken after the sun bath with very good effect, or a cool shower may be used.

Some form of mental occupation must be employed to steady the nerves and to keep the patient's thoughts from himself and his affliction. Idleness is harmful, but heavy mental concentration may prove equally harmful. As a rule, any simple trade or manual labor free from contact with machinery or otherwise dangerous environment may be recommended. Vigorous exercise up to the point of actual fatigue should be

insisted upon daily, as this will utilize energy that may otherwise go to produce the "explosions." This exercise may include general calisthenics or outdoor games, tennis, skating, skipping the rope, dancing, and punching the bag. The exercise should continue until free sweating sets in, to be followed by a short warm bath and then a short cool or cold bath. Delicate persons and women may substitute the hot-air cabinet bath for the sweating exercise, this to be followed by a cool bath and taken three times a week. But in any adults idleness must not be permitted, but some occupation must be insisted upon, of an outdoor nature if possible. The outdoor life is important for the sake of the fresh air and sunshine and wholesome activity to use up a definite amount of nervous energy, but plenty of rest and sleep should be secured, also. All sources of irritation should be avoided, as well as exhaustion, though wholesome fatigue is, as stated, beneficial.

It is important that proper care and attention be paid to any children that have convulsive seizures. They should be removed from school, their education to continue at home for a few fixed hours daily. As they grow older they should be taught a trade free from physical danger, or some handicraft, and should not enter strenuously into mental activities—unless their disease is fully outgrown or successfully treated. The same dietetic and general treatment is applied as for adults.

CHAPTER XVI

Locomotor Ataxia (Tabes Dorsalis)

LOCOMOTOR ATAXIA or tabes (ta'beez) dorsalis (also called posterior spinal sclerosis) is a chronic, progressive disease of the nervous system involving the posterior columns of the spinal cord and the posterior nerve roots, and also the nerves from these origins that pass out to the surface of the body. It is a disease of middle life, most cases occurring between the ages of thirty and forty, the next most frequent age being between forty and fifty. It may be considered a disease of the male sex, since the ratio between men and women afflicted is ten to one, and it is more common in the white race than the colored.

Syphilis is supposed to be the essential and practically the only cause (yet less than one per cent of syphilitics will develop tabes), but the mercurial and other drug treatment is by many, including myself, considered more to blame. Two conditions that make this seem very probable are, first, that in the cases where locomotor ataxia develops there have been but very few of the outward manifestations of syphilitic infection, indicating that the vigorous drug treatment was quickly suppressive and that the infection and the drugs together (largely the latter) directly attacked the spinal nerve centres; and, second, that tabes is a "metropolitan" (city) and not a rural disease, which is largely due, no doubt, to the fact that in cities drug treatment is obtained earlier and continued more

persistently—for, even though these inhabitants do not become exposed so frequently as those of the cities, there are many cases of syphilis in rural districts.

Exposure to wet and cold, combined with extreme muscular exertions, is a possible cause. Soldiers, travelers, and drivers are rather more susceptible, or more frequently affected than others. Excessive railroad traveling, and excessive dancing with exposure while overheated, are said by some to favor the development of the disease. Excessive sexual intercourse, combined with irregular living, and injury of women during confinement are listed as predisposing causes. A long series of depressing emotions is another predisposing factor.

Symptoms. Locomotor ataxia is generally divided, for convenience, into three stages: the pre-ataxic, the ataxic, and the paralytic. The *pre-ataxic* or initial or incipient stage may last from a few months to several years, and frequently the disorder may be kept at this stage. For many months or perhaps years the patient complains of neuralgic or rheumatic pains—sharp, lancinating pains that dart through the limbs or about the trunk; or occasionally they will be in the face, resembling trifacial neuralgia. Numbness and tingling and various unnatural sensations are usually present. There may be only a little uncertainty in walking, which is particularly noticeable in the dark. The patient tires very easily, possibly even without any exertion will feel weary. Sometimes a bladder weakness is present. There may be double vision or other eye symptoms, and the “Argyl-Robertson pupil” is characteristic—the pupil dilates and contracts to ac-

commodate for distance but there is no accommodation for light and darkness, the pupils remaining constantly dilated. The knee jerk and ankle reflex are soon lost. Constipation is fairly constant.

Among the early symptoms are neuralgic pains about the rectum, and hemorrhoids or bleeding piles. The lightning pains that come and go and shoot here and there are very obstinate, and some degree of them exists all through the disorder. Perhaps the most common of these are the stomach pains. These seize the stomach area without warning and may be excruciatingly severe and there is a sensation of tightening of the waist, accompanied by nausea and vomiting and occasionally by diarrhea. These stomach attacks are called "gastric crises" and occur in the pre-ataxic or later stages of nearly every case of tabes. The crises frequently last for several days at each attack. Insomnia has been noted in the early stage, and irritability of temper, as well as despondency.

The *ataxic stage* frequently lasts for several years. The patient's unsteadiness increases to such an extent that he stumbles frequently and soon requires a cane when walking. The characteristic gait is now noted: the patient continues to watch the ground and his feet, and he lifts the feet high in the air ("like a dog in high rye"), bringing the foot down sharply on the heel, and the legs are spread somewhat apart. In turning a corner or in turning around he does it so awkwardly that he sways precariously and is very likely to fall. His feet become so numb that he receives an impression similar to that of walking on a thick layer of carpet. As a rule the patient seems to walk better

after walking for a while and will so remark, but he soon tires and requires rest. He cannot follow a straight line, a chalk line, or a line in the pavement. If he closes his eyes while standing he sways and frequently will fall unless guarded.

The bladder and bowels become troublesome, and loss of bladder control with the dribbling of urine is frequently present. He is usually constipated, but at times may have vomiting spells or diarrhea without apparent reason. Ulcers may appear on the feet, and various muscles may atrophy. Later, the pains and loss of feeling may affect the arms. Insomnia, irritability and moroseness are frequent in this stage also.

In the pre-ataxic and ataxic stages the coördination may be tested by the following methods: Have the patient turn quickly at command; walk on the toes or with the knees bent, or walk backward, or up or down a flight of stairs. Let him walk with closed eyes or in the dark. To test the patient while in bed, have him attempt to make a circle in the air with each foot, or let him try to touch with his toes something held in your hand. To test his arms and shoulders, have him attempt to bring his fingers together in front of him by swinging his extended arms forward, first with open eyes, then with eyes closed; also have him attempt to touch the tip of his nose with his finger, with eyes closed.

His inability to do any of these things results from degeneration of the coördination and sensory fibres in the posterior nerve trunks of the cord. As his ability to sense location and direction, and relationship of self and environment, is interfered with, he lacks orienta-

tion and his imperfect perceptions are still more imperfectly incoördinated and transmitted to the motor apparatus (muscles). He cannot tell by the feet and by muscle-sense just where he is placing his feet or other extremities so he has to watch them and even then he cannot fully control them, because of the loss of normal coördination between brain, spinal cord, and muscles.

The third or *paralytic* stage follows several years later, after a period of alternating improvements and remissions. The patient has now lost altogether the power of walking though the muscular strength of the legs may be fairly good, and the patient is confined to a chair, later to bed. Bed sores usually become a source of trouble. The patient may have so completely lost sensation that he will not feel the pressure of a hand or even the prick of a pin. He still has pains but they are not so severe. He may be confined to bed for years, though death may occur at any time from some intercurrent disease. His mind will often remain perfectly clear but sometimes, however, the mind will be affected, particularly when paresis develops along with the tabes; but in this case the mental condition is due more to the paresis than to the tabes. The later stages and more severe symptoms can, of course, be prevented by proper, early, and persistent treatment.

Treatment. The important points in the treatment of locomotor ataxia are to increase metabolism and build up the vitality, at the same time employ eliminative measures to the fullest extent that the condition will permit.

Long fasts are not advisable but progressive fasting, starting with one day and increasing a day at a time up to two weeks, is of much value. The full milk diet is best to use between fasts, for periods varying from twice to five times as long as the fasting period, increasing the ratio at the four-, seven-, and ten-day fasts. Several oranges should be taken each day with the milk or, if it seems to agree better, somewhat less milk may be used and more fruit taken, using both acid and sweet fruits. If the full-milk or milk-and-fruit diets are too inconvenient, or for any reason impossible, a combination of milk and fruit for two meals and one meal of solid food may be substituted, or a normal solid-food diet may be used—in every case using almost exclusively uncooked foods. The milk or combination milk diets are best, however. All fasts are broken gradually, and care is observed not to overeat at any time. While fasting, exercise is confined to walking (when possible), but while eating general and corrective exercises are to be used. Enemas should be taken daily while fasting and as necessary during the eating periods.

A few weeks' continuous rest in bed, with daily massage and the proper dieting, may be the first stage of curative treatment. But occupational therapy is important and should be employed later. This may be in the form of any light bench work or any other simple work that holds the interest and is not wearying physically or mentally. A hobby is good for these cases to cultivate, providing it is of the proper sort.

Especially for all patients in the first stage and those passing into the second stage, it is highly important

to devise a systematic course of exercises that will tend to develop coördination of movements of the affected muscle groups. This must be kept up for a long time, regularly and systematically. It will help to stay the progress of the disease and enable the patient to walk better and to use his arms better, because the persistent sending of impulses over the nerve paths will help to clear away the obstruction.

Special exercises for re-educating the muscles may be both simple active and resistive movements. Practicing the movements that are difficult to perform will constitute corrective exercises. For instance, practice walking a line or placing the feet, or heels or toes separately, on marks which have previously been inscribed on the floor or ground in all directions, or the designs in carpets and rugs may be used. Ordinary walking when possible is of much value, and should be practiced to the point of moderate fatigue. General exercise should also be used, giving particular attention to the back muscles. Follow each exercise period with a period of rest and relaxation, and rest from exercise entirely one day a week, and always get plenty of sleep.

Hydrotherapy is a powerful agent in the treatment of tabes, but it must be remembered that these patients do not bear well the extremes of temperature. To improve the general nutrition of the body, use the cold-mitten friction or the cold-towel rubbing, the procedures for which have been explained previously. But in these treatments care must be taken to insure prompt reaction, by sufficient friction or by tempering the water as required. As a rule the warm bath at a temperature of 105 degrees for ten to twenty minutes is highly

efficient in improving elimination. After the bath it is well to have a little cold or cool water poured over the body and then the patient should be diligently rubbed.

To overcome the lightning pains, apply rather hot spinal compresses or use the hot half-bath. For the gastric crises and abdominal disturbances apply fomentations to the abdomen, as hot as can be borne and several times daily, and apply the heating compress during the intervals. It is usually well to apply cocoa butter over the surface of the abdomen before applying the fomentations, and usually a dry flannel should be next to the skin, with the fomentation over this. For the rectal pain use the hot anal douch with little pressure, or the hot shallow sitz bath—at a temperature of from 115 degrees to 122 degrees. The annoying insomnia may be relieved by fresh air, lukewarm baths and, if possible, life at the seashore. Change of climate or scenes has a good mental effect and may be taken advantage of when possible, though such change is not necessary.

General manipulations of the body, bending and twisting and stretching all the joints in all possible directions, with particular attention to the spine, will be of benefit and may be practiced three times a week. Hot spinal compresses may be used to good effect with this treatment.

Electricity is useful for its general tonic and reflex effect, and may have an indirect influence upon the course of the disease. The most effective electric treatments cannot be applied at home, but the home "violet ray" outfits may be used for applying a mild form of

electricity up and down both sides of the spine and on the legs, especially for the relief of lightning pains.

Finally, the patient must endeavor to fight courageously and to develop his will power. To assist in this, suggestion is a highly valuable adjunct to physical treatment. One should not permit his condition to depress him, but should take his treatment persistently, regularly go through the exercises and remain cheerful, and it will be found that the pains and incoördination become less noticeable, that longer walks are possible, and with a more natural gait—that all symptoms are gradually, even if slowly, decreasing or, in severe cases or those already well advanced, that the progress of the disease has been halted.

CHAPTER XVII

Infantile Paralysis: Acute Anterior Poliomyelitis

INFANTILE PARALYSIS, technically known as *acute anterior poliomyelitis* (but also called a dozen other names) is an inflammation of the gray matter (containing the nerve cells) of the spinal cord. As explained in the physiology of the nerve system, the gray matter of the spinal cord is divided into wings or horns, an anterior and a posterior in each half of the cord, the two halves being joined together by an "isthmus." This disease attacks the anterior or front horns or wings—whereas locomotor ataxia attacks the posterior horns. It occurs in all ages, but rarely beyond youth, and by far the greatest number of cases appear during the period of eruption of the first teeth and especially under three years of age. About fifteen per cent of the cases are in youths or persons under the age of thirty, and, outside of the infant cases, usually in the male. In infants and small children the sexes are equally affected. It appears all over the world, so climate seems to be no factor; also it appears at any time of the year, but epidemics are usually in the summer and especially in August and September.

There seems to be no specific cause that makes an individual susceptible to attacks. Among the recognized contributory causes may be mentioned chilling of the body when heated or other exposure, falls and injuries,

disturbed digestion, malnutrition or over-nutrition, dentition—because the nervous system is in a state of high irritability—fatigue, overexertion, and lack of sleep and fresh air. Many cases occur in the course of one of the acute eruptive fevers, especially scarlet fever, measles, and typhoid, also diphtheria; and some cases have immediately followed vaccination. Since vaccination is becoming more and more general and since epidemics of a more severe and fatal form of infantile paralysis are also becoming more prevalent and more widespread, it seems reasonable to presume that the pollution of the body with the vile vaccine virus has not a little to do with the increase of the disease. Many cases appear in children of families where there is a history of nervous troubles in other members of the family. Perhaps one reason for the development of this trouble mainly in infants is the excessive use of the muscles. This makes an excessive demand upon the motor cells of the cord—for young children use their muscles constantly when awake, and much more than the sensory nerves and sensory areas of the cord.

Symptoms. In many cases there is a period of "invasion," during which time the disease in the cord is developing. This period is much more common in the occasional case (sporadic or endemic type) than in the epidemic type. There are frequently marked irritability for some hours or a few days, loss of appetite, some degree of fever, constipation or diarrhea, and pains in the back and legs. The mother may afterwards recall that when walking the child became easily tired and asked to be carried. There may be general

weakness and much sweating. Sometimes there is headache, which may be severe, and occasionally there is vomiting. Convulsions are quite frequently present in young children.

In many cases, perhaps in a large majority, there are no protracted symptoms of invasion. There may be a high fever first, with the paralysis appearing suddenly. No fever is noticed in a large number of cases, but as the paralysis is frequently discovered in the morning after the child appeared perfectly normal the day before and upon being put to bed, it is likely that the fever developed during the night. Whenever there is fever it rarely exceeds 103 degrees.

One difference in the epidemic form from the endemic or sporadic form is that older as well as younger children are stricken, also some young adults. The usual age, however, even in this type, is under eight. The fever lasts longer in these cases and may remain for some time after the paralysis has developed. There is much sensitiveness of the body, including the affected muscles, and at first there may be incontinence of urine and feces, a condition never found in the sporadic form.

Whatever the initial symptoms, or whether these are present or not, the main symptom is a flaccid (relaxed) paralysis. This may come on almost as suddenly as a stroke of apoplexy, in which case more muscles are usually involved, and all at once; or it may develop more slowly, when it progressively affects muscle after muscle. The height of the paralysis in any case is usually reached within twenty-four to forty-eight hours. The paralysis most often affects both

legs; next frequently, but one leg; next, the arms and legs; and after that, various combinations; but in some cases every muscle seems paralyzed, even the muscles of the throat. In the stage of paralysis death may follow paralysis of the muscles of respiration.

Now comes a stationary period that may last for from one to six weeks, most often for about two weeks. The muscles become wasted and flabby, but improvement gradually sets in, in the form of a regression of the paralysis. The stage of improvement may last for six months or so, the recovery taking place during this time being mainly spontaneous; but frequently the recovery is remarkably rapid. Usually the paralysis gradually disappears, starting in the arm or leg least affected. This may continue until there is practically a complete recovery, or but one or two limbs may remain more or less affected—in any degree from complete to barely perceptible paralysis.

During the period of recovery, if a member remains in some degree affected it may not grow as rapidly as the normal extremity, but remains smaller and shorter. Both the muscles and the bones fail to grow normally, with the result that in time there may be a well-marked difference in the corresponding members of the two sides. The result may be a deformed leg or knee or foot, etc., or spinal curvature, the latter occurring from the unequal leg support or when the supporting back muscles are affected. In adults the facial nerve may be affected and if not completely restored there may remain some twisting of the face. The general health of the patient is usually good, after the period of recovery is well advanced.

Proper treatment at the very start will always lessen and frequently prevent many of the worst symptoms and later effects.

Treatment. The first essentials are to give the patient absolute rest and to withdraw all food so long as there is fever, except possibly a little unsweetened fruit juice. When there are prodromal symptoms of fever, irritability, loss of appetite, etc., no one can tell what disease is developing; but in epidemics, with other cases around, this disease may be assumed to be the cause of the symptoms; and it is probable that the rest and withdrawal of food will prevent full development of the disease or cause it to develop in less severe form. If, after early symptoms indicate that some disease is on the way, a disease does *not* develop, no one can possibly know whether it was spontaneously aborted or checked by rational treatment, or what disease it might have developed into; but it is safe to assume that, since various symptoms of a severe nature, both acute and chronic, have been caused to disappear by rest of the general body and of the digestive processes and by increased elimination (at least enemas), epidemic diseases including infantile paralysis can be so controlled, in many instances at least.

The patient should be kept in an airy, well-ventilated room with the windows well screened, but care must be observed that the warmth of the body is maintained, though when there is fever the body should receive an abundance of air of moderate temperature, either directly or through very light covering. The bowels should be kept open, and in this case an effective saline laxative may be used once, and enemas later. An ice-

bag should be placed on the spine for half an hour or longer at a time if the fever is very marked, but should be over thin dry or wet cloths and not in direct contact with the skin. The use of drugs is not necessary, for any symptom.

After the fever has largely abated, the application of hot compresses of cloths folded to four thicknesses and changed as necessary, may be applied to the parts affected. This fomentation is primarily a direct excitant, stimulating the circulation of the blood, and the general nutrition. This tends to quicken the elimination of toxins and the repair of the affected parts of the body. The hot compress also has a sedative or calming and soothing effect upon the part of the body where applied. It is particularly helpful when applied to the spine, but so long as the paralysis is progressing it should not be applied to this region. As the heat of the compresses will cause more or less perspiration there is need to prevent possible chilling after their removal. This is generally best accomplished by giving a cool sponge bath or towel rub. If for any reason this cool application cannot be given, rub the patient dry with a soft towel and cover just enough to prevent chilling but not so well as to induce further perspiration.

After the fever the best diet is the milk diet, particularly in young children. A little orange juice should be used daily with the milk diet and the juice only may be given for a half day or full day every four, five, or six weeks, according to the state of general nutrition. Cod liver oil may be used to advantage at this time, if it does not disturb the digestion.

If for some reason the strict milk diet cannot be used, at least considerable milk should be given in a diet otherwise consisting of natural foods, mainly uncooked—all the fruits, green vegetables, flaked cereals (also the prepared dry whole-grain cereals, such as shredded wheat), cottage cheese, and an occasional egg, which may be whipped and added to milk or soft cooked in some manner. Considerable water should be drunk daily.

The paralyzed limbs should be wrapped in cotton or cotton-wool and protected from pressure. As soon as the heightened sensitiveness of the limbs reduces, gentle massage and passive movements may be instituted. These should continue for twenty to thirty minutes at a time and be given at least twice daily. It is far better to have a member of the family give the patient the systematic daily rubbing than to have a trained masseuse coming at irregular intervals; but it is also better to have a trained operator for a while and to have the member of the family observe the methods used so that an effective treatment may be given.

Spinal manipulative treatments, by any of the more highly considered methods and by an intelligent and thoroughly competent and trained operator or physician, are also of value in many cases because of the correction of spinal muscular, ligamentous, or vertebral conditions that interfere with normal circulation or nerve action, and because of nerve stimulation.

Electrical treatments are of great value in these cases and should be provided if at all possible, though these should be given by effective apparatus and by a physician who understands the application of electricity

especially to such conditions. Galvanism and faradism are both employed, also the sinusoidal current, but galvanism is considered the best. The electricity is applied both to the spine and to the paralyzed muscles. Such treatment may need to be given for months, or even years in severe paralyses.

Then comes re-education on the part of the patient, who must practice using the paralyzed extremities as much as possible. After the acute stage has passed it is advisable to discontinue the practice of keeping the patient in bed. Young children should be laid on a well-blanketed floor and encouraged to crawl and move around over the floor. This will provide ample exercise for these cases, though the massage, manipulations, and passive exercises should continue. Older children and adults may be instructed to use the affected limbs by practicing one or more times daily those exercises that will tend to use the muscles of the paralyzed area as much as their condition will permit, and also those muscles not affected but that are employed in conjunction with the affected muscles in performing certain movements.

The various orthopedic apparatuses and appliances that may be obtained for the purpose of relieving the strain from a group of paralyzed muscles or that serve as braces for these muscles should not, as a rule, be used. In the first place, many of these devices, while apparently giving some ease to the strain, are so constructed as to press upon muscles and bones, thereby producing bodily disfigurement. In the second place, their continued use may give relief from pain and pressure and may serve as a suitable brace, but they give

no stimulus to the use of the muscles. So instead of developing the paralyzed limbs they increase the disuse of the muscles and tend to retard the time of recovery of their use. The only excuse for their employment, usually, is to give partial ease after many months or perhaps a few years have passed when it is apparent that there will be little further improvement in muscular development and action, and then only in conjunction with continued use of developmental exercises as already suggested.

The problem of the deformities is one of importance and the question of surgery must sometimes be considered. Is it advisable to operate for correcting any of these deformities resulting from the disease, or to permit nerve grafting to restore the power of movement to the muscles? Much has been written by authorities on this subject, and great is the difference of opinion. The concensus of opinion seems to be that for the most part it is better to avoid these operations, for they so frequently fail to accomplish desired results, or these partial results are temporary and in the long run tend to prevent the body's normal restorative powers from acting. It must be admitted, however, that in a very limited number of cases these procedures may be valuable when done under the most favorable conditions.

Outcome. As a rule, sporadic or endemic cases of infantile paralysis are not fatal. The so-called epidemics, that have spread over or seem to cover a large section of the country and in course of time spring up in different parts of the world, have been followed by a heavy mortality. But this mortality is largely due

to fear and to improper treatment. Most cases that are properly treated from the onset will fully recover or very nearly so.

Some authorities claim that spontaneous recovery from the paralysis is ended by the fourth or fifth month, and that if there is great improvement after that it results from good treatment or proper and graduated use of the affected extremity—usually both. And some claim that regardless of how complete the recovery seems to be, there always remains some degree of paralysis of at least some muscular fibres. But at any rate recovery is sometimes so complete that only by very careful and scientific means can any paralysis be detected. I have known cases where improvement continued for a year and a half, and one case for two years, though in this one case there did still remain the barest affection of one ankle.

CHAPTER XVIII

Multiple Sclerosis

THE term sclerosis in general applies to the hardening of tissues. The hardening is produced by excessive growth of the connective tissues and in the nervous system this is the supporting framework of the nerve bundles. Multiple sclerosis (also called disseminated sclerosis) denotes such sclerosis or hardening in scattered patches throughout the brain or spinal cord or both. More cases have occurred in males than in females, and generally between the ages of twenty and thirty. It may be found in a few cases in infants and children, though not in a fully developed and typical state. While the disease is not especially common in America it is considered to be increasing, or perhaps cases that formerly would not have been so classed are now diagnosed as such.

The general foundation for the development of multiple sclerosis is evidently a weakened nervous system—though heredity is not held responsible for it. It then becomes evident that proper attention to the stabilization of the nerves and the maintenance of good vitality in early life would prevent its beginning. As a general rule, it follows as an after-effect of various diseases that run their courses under usual medical treatment. Here it may be suggested that many of the so-called unavoidable complications of diseases may in fact be entirely avoided when the treatment given follows natural laws, as suggested herein in

relation to specific nervous disorders. The diseases that may be subsequently followed by multiple sclerosis are typhoid fever, pneumonia, malaria, diphtheria, whooping-cough, cholera, and even rheumatism. Exposure and injury are occasionally responsible. Cases have been reported of athletes and dancers having the disease as a result of too great and continued muscular exertions, combined with wrong habits of living in general. Certain occupations lead to its development, as those causing lead, copper, zinc, and manganese (mineral) poisoning.

Symptoms. The disease comes on very slowly and gradually and in fact the patient usually fails to recall when the earliest symptoms began. The muscles are mainly affected. First noticed may be (usually is) a heaviness and weakness in the legs, with pain in the legs and the back. The bladder becomes weak and it is difficult to retain the urine, and later impossible. These conditions may come and go, and may disappear for several months.

Then the walking becomes unsteady—stiff and awkward—not due to muscular weakness for the muscles are, in fact, spastic in action; but there is inability to coördinate the muscles, in other words a form of ataxia. There is a tremor observable only during conscious or voluntary motion—an “intention tremor;” this is usually mainly or only in the hands, but almost any muscle group may show this symptom. The hands become so jerky that the patient cannot dress himself nor carry a glass of water without spilling it. There may be a frequent movement of the head, due to a tremor of the neck muscles. These latter tremors pass

away when lying down. There is difficulty in speaking; the speech is indistinct, words are drawn out in syllables, and in a monotonous sing-song manner. Speech frequently becomes progressively thicker and in severe cases unintelligible. There is interference with swallowing. The eyes vibrate from side to side (nystagmus) for a few seconds when the vision is shifted, or perhaps while the eyes are otherwise at rest, and the vision becomes progressively weaker from atrophy of the optic nerve. From time to time there is pain in the joints and extremities, with some numbness or slight loss of the sense of touch, though usually sensation is little altered.

During the course of the disease there may be fainting spells, and attacks that resemble those of epilepsy or apoplexy. As a rule there is a gradual slowing up of the mental processes, the reason becoming unsound, with distorted comprehension and understanding; the patient may break forth in laughter or crying without cause, but he usually recovers composure quite quickly; melancholia is sometimes present, usually in mild form.

As the disease progresses, paralysis of both legs exists and a condition of absolute helplessness may develop, though the use of the arms is retained much longer than that of the legs.

Treatment. It is essential that the patient lead a quiet and regular life, and develop some outdoor hobby or take up some mild fresh-air occupation free from physical or mental strain. It will be well for him to remain occasionally in bed for a few days at a time.

The dietetic treatment of multiple sclerosis is the same as for locomotor ataxia, which see.

Hydrotherapy should be employed, for the purpose of improving the quality of the blood, the general circulation, and nutrition. The cold-mitten friction or the cold-towel rub or cold douche may be given, this to be followed by massage very carefully administered. Fomentations (hot cloths) should be applied to the spine twice daily, followed by the heating spinal compress. This latter consists of a towel, folded lengthwise, wrung fairly dry from water at 60 degrees and applied to the whole length of the spine from the neck to the coccyx, with a dry flannel laid over the towel, over this waterproof material; and then a cheesecloth bandage may be applied in such a manner as to hold the pack in snug contact with the skin. Before this is applied but after the fomentations have been used for fifteen minutes, more or less, the area reddened by the hot cloths may be frictioned till red by the bare hand dipped in quite cold water (about 50 degrees). A neutral bath (96 degrees to 100 degrees) for as long as the patient desires may be taken daily, but after this he should rest in bed for several hours.

General massage, stretching of the joints but not too vigorously, and exercise of the muscles by the slowly alternating sinusoidal current when this latter treatment is available, will be found of much value, but of equal value are special exercises to overcome the ataxia. Practicing the movements that are difficult to perform will constitute corrective exercises, but it is necessary to avoid more than a fair degree of fatigue. The

patient should keep in the open air as much as possible and take the exercises in the open.

Outcome. The disease follows an irregular course but without some such suitable treatment as suggested it is progressive in nature. Sometimes the symptoms may disappear and the patient apparently recover, but after a varying length of time the symptoms are very apt to reappear. On the other hand, the sclerosis and the resulting symptoms may develop to a certain stage and remain stationary for many years. The average duration of the disease is from five to ten years, but may last for thirty. Death may follow from general exhaustion, but is not infrequently from some intercurrent disease. The chances of ultimate recovery are unfavorable, unless proper treatment is instituted early, but some mastery may be obtained so that there are periods of remissions recurring more frequently and lasting longer.

CHAPTER XIX

Care and Treatment of the Nervous System

ON the preceding pages has appeared information, sufficiently detailed for a definite understanding of the structure and working operations of the nervous system and of the more common disorders and diseases that affect this marvelous system. You are now ready to consider those factors that will tend to develop and maintain a sound and stable nervous system and that *must* be considered if the highest functioning of the brain and of the other divisions of this system are to be obtained and retained.

The care and treatment of the nervous system will necessarily involve many factors, such as general and mental hygiene, diet, exercise, rest and relaxation, play and recreation, hobbies and pastimes, hydrotherapy, massage, electricity, climate, and psychotherapy in some form. No attempt will be made to cover these subjects in detail, as each would require a book in itself; yet sufficient information will be given to enable the individual to help himself, or to be helped by parents or other members of the family, so that in many cases a physician will not be required, or when required or desired that one may work with him for best results.

GENERAL AND MENTAL HYGIENE

It is easily understood that the primary need in de-

veloping or maintaining a sound and healthy nerve system from the standpoint of general hygiene is almost a complete change in the life and manner of living of the present social world. Life to-day is a strenuous competition in the struggle for existence. The adoption of many harmful practices makes it difficult for even the strongest and most favorable hereditary influences to carry one through the formative period to complete development and stability without the foundation being laid for some nerve weakness. Radical change in the social order cannot be readily accomplished, however; therefore we must make the best of conditions as they exist, at the same time avoiding as much as possible the many harmful and weakening influences.

From the earliest childhood, parents or guardians should see that the child eats right, lives right, sleeps and plays right. It is a regrettable fact that few children are properly trained in these respects, mainly because of ignorance of the parents. The child should eat slowly and ample, but should avoid overeating. It should have fresh air, day and night, out-of-door play, cool baths, and plenty of sleep at the proper hours for sleep. When the child is old enough to begin study there should be proper balance between study and work on the one hand and rest and play on the other. Keep the child free from all false fears, such as the dark, and "the bogey man will get you" (if some selfish or arbitrary wish of the parent, guardian, or nurse is not granted).

The slow and backward child must be given more care and attention and should not be required to keep

up in school grades with the average. His study needs to be even more interestingly presented than does that for the normal child. The precocious, the eccentric, and the "queer" child will require a plane of life and plan of study and rest adapted to the individual condition.

As the child grows older, sex education is an important factor. When a child begins to ask questions these should be answered honestly and frankly, but in a way not to arouse further or undue curiosity. If those who have the care of children find themselves unable to answer intelligently the numerous questions with which they will be confronted they should prepare themselves by a study of instructive sex literature of the proper sort.

When puberty is reached and the menstrual phenomenon makes its first appearance, the young girl should already be in possession of the knowledge and understanding that will enable her to appreciate the splendor of approaching womanhood. Similarly, the boy should be able to appreciate the grandeur of budding manhood. Instead, what do we find? Again and again shocks and fears and terrors befall the girls at the period of adolescence—a disgrace to modern civilization. Likewise there is a terrible toll exacted by the suggestive advertising and literature, and by other misinforming sources, of those boys and youths who do not yet know what reproduction is.

Every boy and girl should receive positive instruction on the subject of sex hygiene. The parents should renounce the old attitude of prudery—a relic of less enlightened days; they must cast aside the over-

scrupulous spirit that is (presumably) shocked at any mention of the laws of reproduction. If the parents are not capable of explaining the sexual functions, then it becomes evident that the problem must be left for others to meet—perhaps (and most likely) to the streets and alleys and all manner of by-places. Do not assume the rôle of the ostrich and think that what you do not see does not exist, that what you do not hear is not spoken. And do not make the mistake of presuming that “*my children are safe*”; your children are very probably the same as any other normally inquisitive children, with no more judgment as to what is safe and what is unsafe knowledge or experience.

Without doubt there should be a systematic course in sex education in our schools, leading through the elementary grades and ending only at the close of high school. But even this should not remove from the parents their duty in this matter; it is only someone near to the child who can make the possession of this knowledge perfectly safe. With this properly changed attitude of the parents, with this adequate instruction, with a better and deeper concept of the true beauties and uses of the human body, with a nobler view of the laws of reproduction, the child will be much less liable to those sexual mistakes that so soon weaken or wreck the nervous system.

Then comes the selection of occupation, labor, industry, or profession for the young adult. Misfits will experience many nerve irritations. A poor business man may have made a good mechanic, or an unsuccessful farmer may have made a better professional man, etc., etc. The fear, the worry, and all the associated

nerve strain of trying to fit a "square peg in a round hole" can be eliminated by placing and fitting men and women in their occupation—business, trade, profession, or whatever it may be—as their real, innate and personal capacities and capabilities indicate. It is not what ignorant, selfish, proud, or otherwise misguided parents or guardians believe is best, but it is what the individual can do and is best fitted—mentally, psychically, temperamentally, and otherwise—to do, that should settle the question of vocation and largely eliminate the possibility of a weakened nervous system and a future nervous disorder.

If or when the young adult has made his choice of life work, then comes his own personally arranged mental hygiene. He should continually seek knowledge so that he may know things as they are rather than as they seem to be. He should be tolerant, broad-minded, ready to learn, and not so bigoted and narrow as to be irritated by the contrary views of others. He should realize the importance of right living and right thinking in maintaining general and nervous health. In addition to proper diet, exercise, play, etc., which will be discussed hereinafter, he should give particular thought to the avoidance of bad habits and wrong thinking.

Having received proper sex education, this should protect him from falling into bad sexual habits, but there still remain smoking or other use of tobacco, the use of alcoholic liquors, and dependence upon drugs. These habits all have a specially harmful effect upon the nervous system, not only of the person himself but of his children. The offspring of a parent addicted

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to any of these habits will inherit the tendency to the adoption of these or other baneful habits and a weakened nerve system which will make their adoption still more likely. If a young person has the proper idea of what constitutes real pleasure and what is necessary to true happiness he or she will never fall into such bad habits in search of pleasure or happiness.

I have already explained the evil effects of wrong thinking. But how shall thinking be corrected if it is wrong? Chiefly by observation and practice. Think of, consider, and weigh the subject of every thought and if it is not conducive to health, happiness, or progress avoid further thinking along similar lines. Keep a supply of wholesome subjects to think of so that they can be substituted whenever fear, worry, or thoughts of harm to another seem to be taking root. It will take effort and persistence at first but after a time it becomes easy. If one keeps busy with work and play and cultivation of the mind and body, there will be no time to dwell upon destructive thoughts. One of the best ways to cure worry is to get busy and do something that will remove the thing worried about, or prevent its occurrence, or that will occupy the attention so completely that there will be no room left for worry thoughts. Finally, one should have inspiring ideals and these should be kept always in mind, and an endeavor should be made constantly to live up to them, mentally and physically.

DIET

The special diets needed in particular cases have been enumerated in the various chapters devoted to special

diseases. The diet that is most commonly used is the milk diet and this is particularly of value for those who do not have a specific nerve disorder but are simply "nervous" or lacking in nerve energy.

If the milk diet cannot be used, however, a careful diet of solid foods may be substituted. This should be of milk, fruits, vegetables, nuts, and whole-grain cereals, as much as possible in their natural state—uncooked. Eggs may be used moderately and a certain amount of meat may be of value in some cases, but as a rule meat may be excluded, as unnecessary. However, in those cases of marked loss or lack of nervous energy a few weeks (from two to four) devoted to the Salisbury meat diet may be of benefit. This diet consists of three meals daily of broiled ground round steak, with one green leafy vegetable and from one to three cups of hot water during each meal. The meat may be used in any amount the appetite calls for, but if possible the same amount should be taken daily except during the first few days, when the quantity is gradually increased each day from a very few ounces at a meal up to the full amount. This diet does not call for *any* other food except that mentioned.

Refined sugars should be avoided also, the craving or need for sweets being satisfied by sweet fruits and honey. Such things as tea, coffee, spices, condiments, smoked and pickled foods, foods preserved in sugar, fried foods, gravies, pastries, and rich desserts are, of course, to be avoided. Water is very necessary and an abundance of it should be drunk daily.

The nervous person should form the habit of eating slowly and chewing his food well, as all too often such

patients are inclined to "bolt" their meals. Congenial company with pleasant conversation during meals is helpful, but music, unless very carefully chosen, is not advisable. While diet is of very great importance at all times it is not wise to think of it so much that it becomes an obsession. One should not sit around after a meal waiting to see whether the food is going to agree. One should be sure that he has wholesome food, well prepared and in proper amounts, and that it is eaten properly—perhaps in good company—and then forget about it.

Unless a specific nervous disorder calling for the fast is present, a protracted fast is usually not to be recommended for people subject to nervous weakness, but as toxemia must be avoided in these cases an occasional short fast or, preferably, a limited diet of fruits or of fruit juices will frequently be found of much value, unless there is anemia and emaciation. The bowels must be kept normally active at all times, by diet, exercise, and other natural means, to avoid toxemia from retained waste.

EXERCISE

The majority of nervous people are given to too much introspection; they are prone to consider too minutely some one or other part of the body; and they take themselves too seriously. There is no factor so helpful in breaking such faults as that of exercise. The neurotic, the morbid, the selfish, those susceptible to all manner of influences that should cause them no

concern—all these can be diverted from their depression, even if only for the time being, by a judicious series of exercises; but if made a regular habit this will be found to be increasingly effective in getting the person permanently “away from himself.” As a rule all such exercises should be taken out of doors. They should be conducted regularly and systematically, but should never overtax the strength or nervous energy.

All know that the muscles are strengthened by systematic daily exercises. Experiments have conclusively proven that the nervous system also will be greatly strengthened by the same means, because muscular exercise is possible only through response to the nervous system, and the regular use of the nerves in this manner will strengthen them as effectively as it does the muscles. In addition, all the tissues and functions of the body will be improved because of the better general nerve condition and the better circulation engendered by exercise.

During the exercises, deep breathing should be practiced, thereby increasing the intake of air into the lungs and of oxygen into the body and generally improving the vitality. At the same time the mind is taken away from all depressing thoughts and emotions and concentrated upon the bodily movements. When this is continued daily for a number of weeks it will gradually deflect the mind from those thoughts and ideas which have tended to irritate and poison the nervous system, lower the nerve force, and help make a person a subject of nerve derangements.

The best exercises to use in most cases are walking and general free-hand calisthenics, such as “setting-up”

exercises. If there is a need for corrective or re-educational exercises they are, of course, given particular attention. All exercise is begun well within the strength of the individual and increased gradually as the strength increases and the general condition improves. Plenty of rest is also required. Variety in exercise is advisable, and may be secured by walking, calisthenics, games, and sports. Calisthenics should be memorized or a convenient chart or set of illustrations should be used so as to require a minimum of attention.

In using calisthenics it is a good plan first to move the most important joints in all directions. This improves flexibility and warms up for the more strenuous movements. Start with the neck by bending the head in all directions, then circle the shoulders, then swing the arms in all directions and bend the elbows and wrists; then bend the body at the waist in all directions, raise the legs forward, backward, and sideward, and bend the knees. Carry each movement to the fullest possible extent. After these preliminary movements take any of the following, but use different ones from day to day for variation:

1. In standing position bend forward and touch the fingers to the floor. Repeat, touching the knuckles, then the palms. Keep the legs straight.

2. In standing position stride forward, flexing the arms at the side; then bend forward and touch the floor, return to erect position again flexing the arms, and then to first position. Stride with right and left legs alternately.

3. In standing stride position bend the left knee and touch the left hand to the floor as far to the side as possible; then return to erect position and repeat to the right.

4. In standing stride position with arms overhead, swing the arms down between the legs, then up and out to the side, down again between the legs, and back to first position.

5. In standing stride position with arms extended sideward shoulder high, rotate the body, alternating left and right.

6. In standing stride position with arms extended sideward shoulder high, rotate the body to the left and bend forward so as to touch the right hand to the left foot, return to first position and repeat to the other side.

7. In standing stride position with hands on hips, circumduct (circle) the body to the left, then to the right.

8. In reclining face-up position with hands under the hips, raise both legs and then kick upward alternately with right and left legs as though riding a bicycle upside down.

9. In reclining face-up position with arms overhead, raise both legs and touch the toes to the floor overhead.

10. In reclining face-up position with knees drawn up and hands clasped behind the head, raise and lower the hips.

11. In reclining face-up position with arms overhead, rise to sitting position, swinging the

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arms forward so as to touch the toes, then return to reclining position, and repeat.

12. In reclining face-down position with hands under the shoulders, push the body up with the arms and bend the knees so that the body swings backward until the buttocks rest on the heels, then return to reclining position.

13. In reclining face-down position with hands under the shoulders, push the body up with the arms, holding the hips straight, then raise the left leg, lower it, and return to first position. Repeat, raising the right leg.

14. In reclining face-down position with arms extended overhead, raise arms and legs together so as to arch the body.

Variations of these movements may be employed if desired, as any exercise, except "tensing" exercises, are of value. It is a good plan to follow the exercise period with a cool bath and a short rest.

REST AND RELAXATION

In almost all forms of derangement of the nervous system, rest is one of the most pronounced needs of the body. By rest, as a specific curative factor, is meant the actual remaining in bed for days and sometimes for weeks at a time. This is always necessary or at least it is highly important when there is any form of paralysis which prevents walking or any movement of muscles or parts of the body. But rest as a cure may be abused by over-indulgence.

The rest cure in general should be taken, usually, in some such manner as the following: for a week or two the patient may remain in bed all day; then by the third week he may sit up in bed from time to time, increasing the duration from a half-hour to a number of hours daily. Within six weeks half the day may be spent out of bed, while some light occupation or the exercises advised may be begun.

The Rest Cure is a system of treatment inaugurated by Dr. S. Weir Mitchell. It is calculated "to renew the vitality of feeble people by a combination of entire rest and excessive feeding made possible by passive exercise obtained through the steady use of massage and electricity." The cases most benefited by such treatment are those of women who are nervous, and a large number of neurasthenics.

The treatment is prescribed as follows: Seclusion from relatives and friends; absolute rest in bed for six weeks or more, neither reading, writing nor sewing, and often not raising the hand or turning over in bed without aid. Then massage of the entire body except the face every day for six weeks. Then the use of the induction current with slow interruptions over the whole body except the face and neck for from forty to sixty minutes each day—all combined with the consumption of as large quantities of food as can be comfortably taken. Were it not for the excessive feeding the results would be satisfactory in a larger number of cases and there would not be the complete failure there is in many cases, also there would not be the immediate or later disturbances of digestion that so frequently develop as a result of such "cramming." Eat-

ing beyond the digestive capacity is never of value, in health or disease, whether one is active or at rest. In some cases a fast is best at the start of the rest cure, thus resting the body inside and out. The milk diet goes well with the rest cure. There are, of course, various degrees of the cure, and most cases will not require it at all, plenty of sleep and proper relaxation being sufficient.

The use of relaxation is important in all cases and, in fact, for any person regardless of his physical, organic, mental, or general nervous condition. How this relaxation will be secured cannot be determined dogmatically for all cases. It may be by complete stoppage of work, or by part-time rest, or it may be by changing to a less active work or something that is entirely different, and it may be merely by carefully observing that sleep is obtained only when the entire body has been relaxed by mentally "going over" each group of muscles to insure their release from tension. When one seems to be becoming tense, restless, irritable, or when insomnia in some degree develops, it is time to relax—regularly, and as much as necessary to restore the equilibrium.

Let us say that you are nervous, constantly fidgety; probably easily angered or irritated and prone to give vent to loud and noisy outbursts of temper. Your face may be pale or congested, your muscles are contracted or tense. What shall be done? *Relax!* Again I say, relax! Say to yourself, at odd times during the day, "I shall relax and rest myself"—then do it. Try and try again. Soon you will be able to relax and be rested and soothed, even if you practice it for but

five minutes at a time. I must lay considerable stress upon this matter of relaxation, for it is important. Keep relaxing—either while sitting or lying down. As you are lying in bed preparatory to sleeping, say to yourself, “I am going to sleep”—not something that expresses doubt or fear that sleep will not come or that it will not be restful; but a positive statement, quietly affirmed, that you will sleep restfully.

You who cannot sleep will find that you will largely master restlessness or wakefulness by mastering the art of relaxing. As you lie down relax every muscle of your body. Bend one leg, loosely, then the other; bend the arms, alternately, and let the extremities extend as they will. Thus your body lies loosely spread over the bed. Go over all the muscles to see that there is no tension. Just let yourself sink into the bed. As your muscles ease up, your nervous system will also, the circulation will continue naturally, and sleep will come.

Relaxation is beneficial for reducing or relieving pain. If one has a chronic pain it is usual that he keeps thinking and worrying about it. What happens? The more it is thought of, the more it is felt; the greater the struggle against it, the greater is the suffering. Instead of harboring thoughts of it, try to relax and forget it. It may be, most likely it is aggravated by tension, also by the increased congestion created by mental concentration on the affected region. Of course, one should always seek the cause of a pain and remove that if possible; but in the meantime relax when the pain becomes more severe, and the reduced tension will cause the pain to lessen.

PLAY AND RECREATION, HOBBIES AND PASTIMES

Considering play from the psychological standpoint, it is simply a recurrence to the habits and customs of the primitive man. In those days speed was a vital requisite, either in hunting wild animals or escaping from some enemy. Therefore the present child loves running, racing, skating, and the present man indulges in speed by the same means and by yachting, automobiling, and airplaning. Adults will flock in thousands to witness an automobile race, in multiples of thousands to attend a baseball game, and great throngs will crowd to see a football game or a gladiatorial show. Those nerve tracts that have been stimulated for hundreds of thousands of years in the human race are again stimulated, yet soothed, by a recurrence of the pleasurable excitations of play and sport activities.

The game of golf is a good example; it is a return to the primitive outdoor life. One strides over hill and through ravine and stumbles into and out of ditches; he carries a club and strikes viciously at the ball, follows the ball with the eye, then searches for it in the grass as his forefathers searched for their arrows and missiles. The arms and the legs are used, the lungs draw in large quantities of fresh air, the body feels a glow from the rays of the sun. The nerve currents course through their more primitive and ancient channels, and one unconsciously revels in latent memories and old race habits—to come back to his work perhaps physically tired, but nervously and mentally rested, renewed, and refreshed.

Accordingly, I advise all persons suffering from any degree of any nervous disorder (except paralysis) or any imaginary nervous condition (or, for that matter, any physical disorder that does not prevent), to go out and play, to help regain control over the nerves. But those even with some degree and type of paralysis can get the play spirit and join in some simple game, such as croquet, marbles, flying kites, and such. Boys, with their petty irritations and habit spasms and generally unstable nervous constitutions can join the Boy Scouts, where they will develop good habits, concentrate on many manual activities, and have much to do in the open air. The girls can join a similar organization for them, the Girl Scouts. The adults can take to the road or hills for hiking or tramping or take up camping, hunting, fishing, boating, swimming, skating, horseback riding, dancing (within reason and under hygienic conditions), or play tennis, or any of a number of other outdoor activities on the play order that benefit the nerves.

The number of nervous people is being constantly recruited from the ranks of the overworked business executives, the idle rich, the childless couples, the bachelors, the old maids. The business executives (and the rich) can easily adjust their lives to free themselves from the danger of becoming nervous wrecks or, as is so frequently said, "on the verge of a nervous breakdown." It will be necessary for them to delegate all business matters possible to subordinates and associates so as to avoid shouldering unnecessary burdens. Then the adoption of some hobby will be of advantage in securing the relaxation necessary. This

hobby may be clay modeling, the making of toys for the children, collecting botanical specimens, outdoor sketching, photography, or anything else that appeals, but it should be something of such absorbing interest that it is taken up regularly or at least very frequently.

The childless couple may adopt an orphan, and a new world will open up to them! Instead of devoting the evenings to nothing, or to thoughts of what might have been, thereby creating depression and restlessness and ultimately the weakening of the nervous system, they will have something to interest them beyond the petty problems of living. The play of the children, their joys, their transient sorrows, will interest the adopted parents and the normal instincts of parentage will be developed instead of crushed.

The bachelor and the bachelor maid can usually find a suitable hobby. Each should eliminate the solitary existence of single life by bestowing the human instinct of affection upon some humanitarian subject. It may be as a "big brother" to some boy, or as a "big sister" to some girl. It may be an interest in unfortunates of different classes. Scientific studies may be taken up. One may take up social work, but if one is prone to take others' troubles upon himself he must get into some hobby designed for his own protection. Becoming a Scout Master is certain to keep high one's interest in this movement and in physical betterment. In any of these or other hobbies or pastimes of the proper sort one will wholesomely expend a certain amount of nerve energy otherwise harmfully spent—and by the unconscious nerve training the nervous system will be placed under better control.

HYDROTHERAPY

By hydrotherapy we mean the application of water in the treatment of disorders and diseases of the body. In the preceding chapters the various forms of baths and water applications have been described.

The Specific Application of Water. The application of various water treatments for the specific disorders of the nervous system have been given in the chapters devoted to those disorders. But the application of baths for the maintenance or improvement of health when no well-defined disease of the nerves exists is something few people understand. Most people take hot or warm baths whenever they take baths; and some consider the use of water of value only for cleanliness, and that water is not needed for this purpose oftener than once a week or perhaps even less often.

Every day, winter and summer, the skin is passing onto the surface of the body the waste elements that take this route, all the time the skin is shedding some of its outer cells, and constantly material is accumulating on the body surface from contact with dust, smoke, and grime of city or country. These accumulations require daily removal, for the best health of the body as a whole, and this includes the nervous system. Some form of a bath should be taken every day.

The kind of a bath to choose depends much upon the general physical condition. If one is quite rugged, with good circulation and immediate reaction, the daily cold bath is preferable, as it is the best natural tonic of all baths—and of all tonics. If the vitality is lower,

then the temperature of the bath may be raised somewhat, but it should still be cool enough to give some degree of shock to the nervous system; and more friction during and after the bath, or more exercise before or following the bath may be necessary to bring about the beneficial reaction. It is not so much the application of cold in itself that is so beneficial, but the reaction; and this cannot be produced by any means so satisfactorily as by cold- or cool-water applications.

If the vitality is decidedly low, then it is best for the patient to stand in three or four inches of quite warm water for two or three minutes before beginning the cool bath, and the best form of bath will be cold or cool wet-hand rubbing, the cold-mitten friction, or the cold-towel rub. The first is a very mild bath, the next a little more vigorous, and the last still more so, but they all have a very favorable tonic effect and none are too shocking. As the vitality increases the bath may be made colder, or a more vigorous application may be made, or the water in which the person stands may be lowered in temperature, reduced in amount, or remained in for a shorter time, and eventually this preparatory foot bath may be dispensed with.

The baths just given are for their tonic effect. The plunge, shower, pouring bath and cold douche may be taken when the patient's vitality will permit, but remember that the colder the bath, the shorter must be its duration and that the vitality increases more rapidly the colder the bath is, providing prompt reaction is established.

If a person takes some form of tonic bath daily, pos-

sibly occasionally merely a vigorous dry friction bath, and allows the skin to breathe by wearing porous clothing in the fewest numbers and of lightest weight possible, takes nude air baths in his room or elsewhere and, when possible, a nude sun bath, he will not require a cleansing bath very often. But once a week may be arbitrarily given as a suitable interval for such a bath. The best way to take this is not while seated in a tub of hot water, as is customary, but to first catch a small amount of water at the desired temperature in the hands and splash it over the arms, chest and abdomen; then prepare the soap lather in the hands and use the hands vigorously over the wet parts, which should then be splashed, sprayed or rinsed with cloth or clean sponge. The remainder of the body may then be bathed in a similar manner, after which as much hot water as desired may be quickly applied by any preferred method, and the bath completed by a quick cold application and vigorous friction while drying. The bath *may* be taken in a tubful of hot water but it should be completed within five or six minutes, to avoid the depressing effect of prolonged heat, and it should be followed by some form of cold or decidedly cool bath.

To calm the general nerve system it is best to take a neutral bath for from thirty minutes to one or two hours immediately before retiring. The same soothing effect may be secured by the use of the wet-sheet pack. The sheet should be wrung quite dry from water at a temperature of 70 degrees to 75 degrees, and the patient should not be so warmly covered over this as to cause perspiration.

STRENGTHENING THE NERVES

MASSAGE

Closely associated with hydrotheraphy is massage, of which it is a natural accompaniment. Massage is manual manipulation of the muscles of the body. The recognized factors of a complete massage treatment include the following: effleurage, friction, petrissage, tapotement.

Effleurage consists of very light stroking of the surface of the body in various directions with the tips of the fingers. To obtain a soothing effect upon the nerve centres effleurage is applied from the centre outward—in the opposite direction to that of the venous circulation. Friction is systematic rubbing of the body surface with the bare hand. This movement reaches the superficial muscles and the deeper tissues, though it is sometimes given vigorously enough to affect all the soft structures of the part, even to the deepest muscles. It should be mainly in direction toward the heart. Petrissage, known also as kneading or pinching, is performed with the thumb and fingers or with the fingers and heel of the hand, portions of the body such as muscles or groups of muscles being grasped and kneaded by different manipulations. Tapotement is a slapping movement performed with the palms of the hands or the palmar surfaces of the fingers, or a chopping movement made with the little-finger border of the hand. The tips of the fingers may also be used with a tapping movement, and the lightly clenched fists may be used to beat upon the larger groups of muscles of the back, hips, and legs. Vibration by the hands usually completes a massage treatment.

CARE OF THE NERVOUS SYSTEM

Massage relieves tension, improves circulation, and gives passive exercise. In spasms of the muscles it is very effective if kneading and rubbing are perseveringly employed. Neuralgias are sometimes best treated by light tapotement. Among the various nervous disorders greatly relieved by massage properly applied are included neurasthenia, hysteria, some degrees of writer's cramp, insomnia, migraine, and infantile and other paralyses.

ELECTRICITY OR ELECTROTHERAPY

Electricity plays a part both in giving relief to and as a means of diagnosing nervous disorders, and is also used in conjunction with hydrotherapy. Its positive value is far less than has been formerly believed; benefits from its use are to be credited more to its psychological influence than to its own therapeutic effect. But nevertheless there is a positive therapeutic value and a definite field for electricity in nervous disorders.

There are a number of forms of electricity that may be used, but treatment by most of them must be obtained from a physician (medical or drugless) who has suitable equipment and experience. Static, galvanic, and faradic electricity are the most satisfactory in many cases, especially of paralysis. High frequency, especially the so-called "violet ray" from high frequency, and the sinusoidal current are excellent. "Autocondensation" from the high-frequency apparatus is good in high tension cases. The rapidly alternating current of the "violet ray" gives the cells a sort of vibratory massage which is stimulating yet at

the same time soothing. The ray is also antiseptic and pain-relieving. It is of value in neurasthenia, neuralgia, headache, insomnia, and the various forms of paralysis. The sinusoidal current is one so arranged that it flows in waves. As it flows it causes muscle contractions and as it ebbs it allows the muscles to relax. It is especially valuable as a means of exercising paralyzed muscles.

CLIMATE

Climate may be classified as enervating, sedative or relaxing, and stimulating. Ocean or coastal climates are in general moist and equable, with pure air and freedom from dust and, largely, microorganisms. Such climatic conditions as are present in Southern California have a sedative and relaxing influence upon the nervous system. Respirations are usually deeper and slower. In high altitudes the principal features are purity and dryness of the air, a cool temperature in summer, and an abundance of sunshine. The physiologic effects of such climates are the stimulation of the respiration and an increased appetite and sense of well-being. Those types of nervous diseases in which depression is a factor are favorably helped by such high altitudes.

Desert climates are characterized by an abundance of sunshine, extreme dryness, purity of air, and fairly equable temperature. Patients suffering from neuritis will find benefit from a desert climate. As a rule warm marine climates and sea voyages are best for neurasthenic invalids of the irritable type. Camp life in the

Adirondacks and other mountains has been found useful for many neurasthenic subjects. As a whole, however, the real essential is not so much any special climate but an abundance of fresh air. Patients will usually make about as good progress in one climate as another if the general and specific treatment is properly adopted and adhered to, though for those who can afford to make a change, either for the sake of a different climate or a change of scenery and environment, this may be a means for somewhat hastening favorable results.

PSYCHOTHERAPY

Psychotherapy, used in the broadest sense, includes all those measures or methods of treatment of bodily or social ills which bring about in the mind of the patient a mental attitude or train of thought that is favorable to healing. Accordingly, psychotherapy may be divided into four groups, in their relation to general nervous disorders. These groups or phases are, hypnosis, suggestion, re-education, and psychoanalysis.

Hypnosis. Hypnosis may be said to be the foundation for scientific psychotherapy, though it is itself of little practical importance in healing. It is a means of impressing certain ideas on an individual's mind, after placing the subject in a condition of modified consciousness; in other words, he has been placed in a mental state between sleep and awake. It can seldom be used upon those who are weak-minded or mentally inferior, as it requires sufficient ability to concentrate the attention for the subject really to hypnotize him-

self. Even if susceptible to hypnosis, those of mental inferiority are not benefited by its use, for their mental condition makes them susceptible to peculiar ideas and thoughts, and hypnotism may deepen this characteristic. It can be used upon those possessing the neurotic constitution, but only to discover the cause of the mental factor in their abnormal conditions. In these cases, if too prolonged it will aggravate the condition.

Hypnotism has been successfully used in hysteria. In fact, some of the greatest modern investigators of hypnotism consider it to be a characteristic of hysteria—that the hysteric person is self-hypnotized—but as applied in treating these cases a change in thought is accomplished. Though hypnotism as a practice should rarely be used, it must receive the credit that it has served to compel the recognition of the influence of the mental processes upon disease and its correction.

Suggestion. Suggestion is the process of arousing in the mind an attitude or thought, or of inducing mental associations leading to the modification of the patient's emotional and intellectual state, that will make for a better adjustment of self to environment.

If the suggestion is to be given by another, the patient is persuaded into a quiet, receptive mood. Then suggestions are patiently and insistently repeated or commanded. This procedure may have to be repeated for many times before the subject (patient) will receive the impression desired. To some very susceptible people suggestion may be received through the laying on of hands. Suggestion is of great value in cases of those with fixed ideas or habits, morbid fears,

morbid melancholic moods and disposition, those who continue to think of their symptoms. The problem is not only one of the subconscious mind, where the memory of the trouble may be buried, but it is also one of the conscious mind; for many nervous individuals know what the trouble is and are willing to help the suggestor in eliminating the cause.

Suggestion may be used to more or less advantage in all conditions, but is more particularly indicated in some than in others. In addition to those named above, we have the cases of paralysis which are mainly or purely psychic, that is, due to mental thoughts and not based on a physical disorder of the muscles or nerves. The individual may claim a paralysis, say, of the right arm; he cannot move it. Without any preliminary warning one may call out quickly and sharply in a commanding voice the order: "Raise your right arm!" The suddenness of the order may produce the action. If not, continued suggestion will usually produce the desired results. A great number of shell-shocked nervous cases that resulted from the World War may be listed in this heading, but there are numerous other similar cases, especially in hysteria. It may be blindness in one or both eyes, a deafness in one or both ears, it may be paralysis of arms or legs. Suggestion will bring cure to many of these cases—where a real physical cause does not exist.

Then suggestion may be used in the form of encouragement to a partially paralyzed adult who is, perhaps, bedridden—the suggestion that he will be able to walk, that he will become stronger and stronger; this is suggested to him day after day. Then comes the

case of the practically completely paralyzed individual who remains in bed or in a wheel chair for years. He may see his or another's child playing with matches or in a dangerous environment and suddenly the child's dress is on fire or the child is in imminent danger. With a cry the paralytic may spring up and place the child in safety. He has been cured, by suggestion or, rather, by blocking the thought channels that have so long conveyed the idea of infirmity, and the danger to the child overcame the inhibitory or negative forces of his body to produce a physical as well as a mental cure. It cannot be supposed that most cases of this nature can be remedied by suggestion in any form; but this is a factor of great value when properly and persistently employed.

The fundamental requirements for success in the use of suggestion as a self-treatment are the ability to relax perfectly both the mind and the body, and the ability to concentrate on a particular thought. Relaxation of the body is comparatively easy, as the sitting or recumbent attitude, deep breathing, and the desire to relax will soon bring it about. Every part of the body can be mentally surveyed to see that it is relaxed. Mental relaxation is more difficult but a little earnest practice will produce results. Refuse to give the attention to any thought which appears before the mind and try to keep the mind as nearly blank as possible. Then when relaxation is complete begin to think the thought that is to be used for suggestion and think of nothing else for about fifteen minutes. The same thought may be repeated whenever convenient during the day, whether relaxed or not, and this will not only

be of additional direct benefit but will be of value in developing the ability to relax and to concentrate.

Psychical Re-education. The ideal aim of psychotherapy is re-education. Some of its aims may be seen from the following summary made by an authority: "This method contemplates teaching the patient what he has, what he has not, what he seems to have, what he can do, what he cannot do, and what he simply believes he cannot do." The process involved includes first a thoroughly friendly talk between the patient and the practitioner, or between the patient (if a younger person) and the parent, or if an adult with a friend of good common sense and clear mind, who possesses the confidence of the individual. Let the patient tell everything about himself; never interrupt, never reply. You may readily recognize what the trouble is, or what the nature of the fear, fixed idea, or notion may be. Then tell the patient the exact nature of the mental machinery and its processes. Even if you are not a psychologist, or a medical practitioner, but have a fair knowledge of the nerve system as may be derived from a careful reading of the chapters on the anatomy and the physiology of the nerves in this book, you will be able to give a good explanation. Then point out the foolishness or error of the false idea or notion.

The next step is to acquire the absolute confidence of the patient and his hearty coöperation. Then, day by day and week by week keep at him until new ideas, new thoughts based on true mental laws will drive out and supplant the false and the erroneous. The final aim is to make him see that his idea of the mental dis-

ease was all wrong, and to confess and to replace it with new and right ideas.

Professor Ewer gives an interesting example of psychical re-education, "that of a girl who had been troubled from early childhood by a fear of noise. She was healthy and naturally cheerful, but suffered keenly from thunderstorms, explosive fireworks, roaring trains, and the like. A slamming door made her cringe, and the starter's pistol at a track contest served to keep her away from the field. 'Some of my friends wonder why I tear up every paper bag I find,' she said with a smile. She overcame the fear by a prolonged effort in which there were several graduated factors. It began with the deliberate imagination of noise, accompanied by persistent relaxation of the tense muscles, which automatically stiffened at the mere thought. From this she advanced to actual experience of noise, increasing degrees of which were provided in various and ingenious ways by obliging friends, who participated in the treatment with the utmost cheerfulness. The process continued for several weeks with the general character of a protracted joke, and a steady elimination of the unpleasant reaction. The outcome was a comparative freedom from the fear, and a normal enjoyment of much that had previously been painful."

From a survey of the facts given in the preceding paragraphs, it becomes evident that re-education does not require any special education or training for its application. This leads to the next step, wherein the patient may try it upon himself, in which it becomes a matter of autosuggestion. Then the teacher may employ it as part of her work in teaching. This pro-

cedure can be used with all the so-called neurotic patients, so that in practically all the minor forms of nervous disorders it is nothing more than a means of training the will.

Psychoanalysis. As the field of psychoanalysis has its champions in both the United States and Europe—and great is the difference of opinion as to its aims and policies—I shall not attempt to enter into any controversy. Nevertheless, as this book aims to cover any and all possible means and methods known which may help to strengthen the nerve system, something must be said of psychoanalysis. In the beginning it is essential to find a definition of the term that will give an idea of its real purpose in the healing arts. I will then quote Dr. Oskar Pfister:

“Psychoanalysis is a scientifically grounded method devoted to neurotic and mentally deranged persons . . . which seeks by the collection and interpretation of associations . . . to investigate and influence the instinctive forces and content of mental life lying below the threshold of consciousness. The primary idea is that of the subconscious mind. When we say a person is conscious, we mean he knows what he is doing, and why he is doing it. Then as we know, anything that is done, is seen, is felt, is heard, and so on, passes to the memory. Take a concrete example: I look at a flower, I am told the name of it—daisy, this being the first time I have seen this flower. Tomorrow, someone says to me: daisy. I recall from my memory, a picture of the word daisy. Let a number of weeks pass by, and someone mentions the word daisy. Now I think, I recall that I have heard the

word before, but it is not clear to me. I keep on drawing it out of the hidden part of my mind. It is now on the border line between consciousness and unconsciousness, or subconscious. Gradually it comes fully into the mind. In the same way, many thoughts, many acts, of early childhood have passed into the subconscious mind."

Some believe that the subconscious mind is directed by sexual impulses, not only the question of reproduction but all the elements of love and passion devoted to them. There is, however, a something that checks you and restrains you from being controlled by these impulses. This check or censor may be the result of the education and training of generations and generations. In the individual there comes a struggle between the censor and the impulses, and this leads the person into mental disturbances and mental weakness. Others claim that the motive is not that of sex but of desire for power and personal safety, but the result is the same in either case. Psychoanalysis is, then, nothing more than bringing out the hidden motives which brought about the nerve derangement. The underlying purpose is to seek the cause. It is not so much a method of cure as it is a method of finding out just what repressions are disturbing the individual, although often the mere discovery of the cause is sufficient to eliminate it and the effects. Psychoanalysis can be successfully employed only by one who has made a thorough study of this subject, with a background of a complete knowledge of all mental and psychic processes.

RELIGIOUS PSYCHOTHERAPY

A very important factor in aiding the individual to master his nerves has been and still is religion. As far back as history goes, we see body and mind or body and soul go hand in hand, as healing arts and religion. All mental disturbances were considered by ancient man to be due to external, supernatural agencies, and therefore the priests, the medicine-men, the witch-doctors or magicians who represented these agencies had, presumably, the power to drive out the evils in the body and restore the mental condition to normal. To-day, the principle still holds true. The very founders of the great religious systems, Jesus, Buddha, Mohammed, and Confucius, were great healers. Everyone admits the mental relief obtained in confession. No matter what the nature of the error may be, no matter what law has been violated, no matter how evil the thoughts may be—a confession leads to mental relief.

This brings us to the value of the special schools of religion, which play a part in "cure." Belief naturally is the foundation, and faith is its associate. In no disorders is religion of greater help than in those of the mind. I am not holding any brief for the specific schools, nor am I entering either into criticism or defense. This book aims to give the reader every means known that will enable him to master his nerves. Brief remarks will be given of some of the forms of religious psychotherapy.

Christian Science. Christian Science lays stress

on the fact that evil, the devil, or Satan does not really exist in the light of the true meaning of the word real. Christian Science does not deny that sickness, want, evils, pains, and so on, exist relatively. So it is nothing more than a form of suggestion whereby ideas of health are installed in the mind. What are the practical methods followed? You must read the Christian Science textbooks of the founder, Mrs. Eddy. You must meditate upon their teachings. You must attend the church meetings. You must consult with a Christian Science healer. Finally, you must at all times refute all ideas of disease. What is the result? Always thinking of health, and always acting as though in health, removes the mental inhibitions and allows the unconscious mind, which directs the healing forces of the body, to work unhindered so that health eventually becomes the true state.

Christian Science is helpful in all the minor forms of nervous disorders, including those mental ones of fixed ideas and fears of this, that or the other thing; worrying about a thousand and one trifles, and so on. It gives mental peace. It gives a brighter view of life. Church gatherings and smiling countenances take people out of their own solitary lives, in contact with the social community. In other words, Christian Science is a substantial and real mental hygiene.

New Thought. The central idea of New Thought is the superiority of mind over body, and that all diseases may be avoided by proper mental attitude. Here, again, suggestion is the key. Wood in "New Thought Simplified," states: "Retire each day to a quiet apartment, and be alone in the silence. Assume the most

restful position practicable; breathe deeply and rather rapidly for a few moments, and thoroughly relax the physical body. Rivet the mind upon the suggestive lesson, fasten the attention upon its final ideal, try to *feel* it with every nerve centre in the body. Give yourself to it until it fills and overflows the whole consciousness." So a study of the lessons themselves exalts the spirit and subdues the body under the influence of the mind. Sincerely followed it promotes health and gives peace of mind.

The Emmanuel Movement. The Emmanuel Movement is the name given to the most serious modern attempt for the moral treatment of nervous disorders. The founders hoped to find a dividing line between religion and medicine in application to the mentally disordered. They used psychological principles and on occasion, with the approval of the patient, hypnotism.

THE DRUG EVIL

Before concluding the final chapter on the means and methods of care and treatment of the nerve system, it is necessary to give some space to the great evil of the day which particularly affects the nerve system, namely the use of drugs in place of the proper regulation of the habits of living. To understand thoroughly the relation of drugs to the nerve system it is necessary to recall what has been said in the chapter on the physiology of the nerve system, in relation to the stimulation of the nerve centres, and in the present chapter the comments on relaxation.

STRENGTHENING THE NERVES

You were told that the art of relaxation should be mastered in all forms of nervous disorders. Relaxation is one of the most important natural agents for strengthening the nerves. Any and all drugs that may be used to stimulate the nerve system become the antagonists of relaxation. Whereas in relaxation the nerve cells are quieted, whereas the nerve centres in the spinal cord and brain are freed for a time from strong external or internal excitations, thereby giving rest and restoring the vigor and strength of the nerves, in drug-giving we have the opposite. The drugs keep on stimulating and exciting the nerve fibres, thereby increasing their irritability, until a time comes when either the nerve cells have reached their maximum degree of irritability, or are no longer able to act without a continuation of the use of the drug stimulant. What is the final result? The nerve cells have become trained to do their functioning under the influence of drugs, and therefore can no longer perform their activity without them. Therefore to use stimulants in place of rest is the greatest error that can be made by sufferers of nervous disorders.

Another caution in relation to drugs, and that is the problem of inducing sleep, in all nervous cases wherein sleeplessness is a factor. In no case can a drug be said to induce normal sleep. It merely deadens the nerve cells, filling the body with foreign products and increasing activities of the other organs of the body and making the subject a prey to various organic troubles. At the same time the cause of the sleeplessness has in no way been relieved; the condition is continued, and one is again a possible candidate for a drug

addict. The same holds true for those who take drugs to relieve headaches or other pains, or to calm irritable nerves. The taking of drugs for any of these two conditions will only lead to highly irritable nerves, a weakened heart action, and other functional and, later, organic disorders.

Closely related to the drug evil is the patent medicine fraud. While these medicines are recommended for a great variety of ailments, they seldom contain drugs that have any direct effect on the condition. In most cases they are merely stimulant, sedative, or cathartic. They serve to mask the patient's symptoms and he thinks he is better, while all the time he is adding more poison to the body. Laws have been passed requiring the bottles to be labeled, showing composition and content; but they have only slightly improved the situation, for the majority of the users of the patent medicine pay no attention to the labels or, if they do, the nature of the contents within means nothing to them. Then there is but one solution—do not take patent medicine for any form of nervous disorders—nor for any other disturbance!

Finally, *keep smiling*.

Be of cheerful disposition. Train your mind. Train your body to be under the control of your will. Develop poise. Avoid drugs. Follow the various principles given in the text. Then you will have learned and mastered the art of strengthening the nerve system.

[THE END]



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Physical Culture Cook Book

By BERNARR MACFADDEN

Delightful, tempting, delicious dishes—chock full of all those elements so essential for perfect nutrition. Easily prepared at small cost. Sounds like a paradox, doesn't it? Especially to those of us who have always neglected, or eaten with distaste, all so-called health foods. Because perhaps they were no more appetizing than sawdust or shredded corn husks, and besides cost too much in time, energy and money to prepare.

But now the old unsavory health food bugaboo has been flouted. A new way has been found to prepare tasty, inviting meals which really build health. Those which make for ruddy complexions—bring a sparkle to the eye and buoyancy to the step—and yet sacrifice neither delicious taste nor delicate flavor.

More Than a Cook Book—a Health Guide

Bernarr Macfadden insists that food to be really beneficial, must be appetizing. With this thought uppermost in his mind, and with a background of years of experience in food and diets—he has written his own Physical Culture Cook Book. And it is different from every other cook book ever published. It doesn't merely list a series of recipes to tickle jaded palates. It doesn't simply present all the latest fads of cookery. But actually teaches the practical art of selecting, preparing and serving delicious foods that build real health, strength and vitality. Foods that cost less money and require less time in their preparation. In fact, it is much more than a cook book, rather a safe and sane guide to permanent health.

Bound in heavy cloth, Price \$2.00

Preparing For Motherhood

By BERNARR MACFADDEN

No matter how strong the mother instinct may be, no matter how desperately she may long for babies, no woman can think of childbirth without the cold hand of dread gripping at her heart.

But there is a very great deal that you can do in preparation for becoming a mother to reduce the unpleasantness and discomfort of the preliminary period and make the final ordeal surprisingly easy and comparatively free from pain.

"Preparing for Motherhood," by Bernarr Macfadden, is a godsend to prospective mothers. In it he tells you the things every woman should know regarding motherhood. He goes into the subject fully, fearlessly and simply. If you prepare yourself along the simple lines he recommends, follow out the common sense instructions given, you can enter upon the ordeal of motherhood with a mind free from worry, and the glorious anticipation of the coming of fine, healthy, beautifully developed babies to fill your life with sunshine. This splendid book should be in every home.

Chapter Heads of This Helpful Book

The New Motherhood.	Diet, General Care and
What Mothers Should	Hygiene During "Lying
Know About Eugenics.	In."
Making Motherhood Safe	Getting Up After Confinement.
and Easy.	Exercising for Quick Recuperation Following Confinement.
Preparation for Conception.	Amazing Remedy for Blood Poison.
The Signs and Progress of Pregnancy.	General Care and Hygiene Following Confinement.
The Importance of Rest.	Does Maternity Mean the Loss of Your Figure?
General Hygienic Considerations.	Keeping the Breasts Firm After Childbirth.
Symptoms and Ills of Pregnancy.	Making the Birth Easy.
Clothing for Pregnancy and Lactation.	
Preparation for Childbirth.	

Substantially bound in cloth, Price \$2.00

The Miracle of Milk

By **BERNARR MACFADDEN**

Through the ages milk has been the great builder of sturdy races. It has come to the aid of the weak and the ailing, and it has made of them men and women fit to face life's hardships. It has added years to their lives—it has given them more life while they lived.

Milk possesses energy-building powers greater, perhaps, than any other substance in the world. It brings quick reinforcements of red, tissue-building, disease-fighting blood to the weakened body and gives it the power to overcome practically any ailment.

Milk—the master healer!

How does milk cure? Milk cures only because it furnishes elements which are badly needed to make new blood. Milk is an easily digested and assimilated food containing ample amounts of all substances required for growth of tissues and organs, and repair of worn-out cells. When taking milk one does not have to worry about combinations or whether this element or that element is being supplied. They are all there in the milk, in living organic form, and the sick body uses them to the best of its ability.

Bernarr Macfadden has had the opportunity through his connection with The International Health Resort to personally study thousands of cases where the milk diet had been administered. He consented to write upon the subject and the result is a book that we are proud indeed to be able to supply as coming from the presses of the Macfadden Publications, Inc.

Simply written, easily carried out, with a marvelous depth of wisdom born of the widest kind of experience, the instructions tell you just what to do, what not to do, what to watch out for, everything in fact that you could possibly need to know in order to get the last vestige of physical benefit from the exclusive milk regimen!

In a substantial cloth binding; Cost \$2.00

Constipation

Its cause, effect and treatment

By BERNARR MACFADDEN

Constipation is undoubtedly the most dangerous of all diseases—dangerous because it is the prolific source of so many other diseases. Constipation prepares a fertile field for the development of germs and toxins. It lowers the body's resistance and enables fatal disorders to gain a foothold.

The man who is constipated is a poisoned man. His intestinal tract is a factory of infection, making and liberating millions of active and dangerous disease germs. The chronic constipated is usually pale and nervous. He lacks ambition and zest for work. He is often depressed and irritable. And there is no reason for his feeling otherwise. A constipated body is a clogged body, alive with poisons that drain the body of health, vitality and ambition.

Help at last for thousands of people

In this book Mr. Macfadden tells you what constipation is, what causes it, what effect it has on the general health and how to overcome it. He tells you the simple things you must do to eliminate the wastes of the body—he tells you how to diet—what to eat and what to avoid—he gives you page after page of splendid exercises—a big section of close to fifty pages of specially-posed pictures—he tells you everything you need to know in order to conquer this insidious menace to life and health.

He shows you how to make yourself alive with physical and nervous vigor—how to bring perfect harmony between all your numerous internal organs. His methods are simple, but thorough. Everything is made as plain as day. With this book in your hands you can learn to cure the most stubborn attack of constipation.

Heavily bound in cloth, Price \$2.00

Strengthening the Nerves

By BERNARR MACFADDEN

Millions of people are today only half alive and don't know it! They suffer from obscure ills, worry about imaginary troubles, find it hard to concentrate and easily fall a prey to disease that robs them of their vital powers—all as a result of continuous neglect of their nerves. Bernarr Macfadden, in a wonderful new book, shows how to recharge your under nourished nerves and how to acquire glowing health and youthful vitality by following a few easy, natural rules. No medicines, drugs, or self-denials, no exhausting exercises or disagreeable diets!

If you follow Bernarr Macfadden's advice faithfully, you will be overjoyed at the results. You'll look better and feel better than you have in years; you will have greater endurance, a keener appetite and a happier outlook on life than you ever had before. You will banish headaches, worries, constipation. Your complexion will become clearer, your eyesight stronger and you will gradually build up a vigorous body that will be able to resist nearly every ailment that is at present sapping the energy of thousands.

The book is written in an easy, fascinating style. There is nothing difficult to understand. You'll enjoy every page because it shows you the way to glowing health and vigor. The knowledge you'll gain from reading Bernarr Macfadden's book will help you throughout your entire life, for it will build for you a solid foundation for your future success and happiness.

Substantially bound in cloth, Price \$3.00

Strengthening the Eyes

By BERNARR MACFADDEN

Glasses are only eye crutches. They simply bolster up the eyes—they cannot cure or eliminate the conditions responsible for the trouble. They are useful just as crutches are useful for an injured leg, but they can no more restore your eyes to their former strength than crutches can mend a broken limb. The real help must come from other sources. In the case of eyes it is exercise.

Over 20 years ago Bernarr Macfadden, father of Physical Culture, had a most trying experience with his eyes. Due to many nights of hard literary work under poor artificial light, they became terribly strained. The idea of wearing glasses was intolerable, so, always willing to back up his theories by experimenting upon himself, he immediately started in upon a course of natural treatment that he fully believed would help him.

The results were so entirely satisfactory that he associated himself with one of the few really great eye specialists and together they entered upon a period of experiment.

Why tie yourself to eye-glasses for life or why continue using them if you are already doing so, when it is not necessary? If you are suffering from any of the following eye troubles you can secure wonderful relief through Bernarr Macfadden's incomparable treatise upon eye-sight—

Faulty Refraction
Far Sightedness
Near Sightedness
Astigmatism

Cross Eyes
Squint Eyes
Eye Headaches
Eye Strain

The extent of the relief obtained by thousands of sufferers is almost unbelievable. It is entirely possible that after a few weeks of home treatment using this work as your guide you will be able to do away with the use of glasses.

Here are some of the chapter heads. They will give you an idea of the value and scope of "STRENGTHENING THE EYES":—

The Anatomy of the Human Eye, The Physiology and Physics of Vision, Weak Eyes, Errors of Refraction—Their Cause and Cure, Color Blindness, Squint, Injuries, Common Diseases of the Eye, Eye Exercises, Saving the Sight of the Children, Eye Focusing Exercises, The Eye Bath, Eye Hygiene, Massage, Constitutional Improvement for Strengthening the Eyes, Sleep, Test Your Own Eyes.

You owe it to yourself and to your family to secure a copy without delay.

Bound in cloth, Price \$3.00

Fasting for Health

By BERNARR MACFADDEN

The greatest single contributing factor to Mr. Macfadden's enjoyment of perfect health, is his strict attention to the food he eats. Moreover there are periods when Mr. Macfadden eats no food at all for he has found that fasting when scientifically practiced will free the body of matter detrimental to perfect health.

Nature fights disease or weakness in your body through the medium of your blood. Blood is your army of protection. When not occupied otherwise your blood gives its attention to fighting disease, killing off obnoxious germs, removing dead cells—in a word to freeing the body of everything detrimental to physical happiness.

When food enters your stomach it must be digested. The process of digestion occupies the entire attention of a large part of your blood supply for several hours. As in battle, let not your army of protection be called away to lunch while the enemy (disease) is still active.

When a horse is sick he "gets off his feed." Natural instinct tells him to fast and he obeys. Not another mouthful does he eat until natural hunger returns. And natural hunger returns only when health is restored.

Fasting for Health is unquestionably the most masterly, the most complete and far-reaching work on fasting that has ever been written. We do not know of another man in the entire world as able to deal with the subject of fasting as Bernarr Macfadden. After going thoroughly into the general aspects of fasting he takes up case after case of the specific treatment of functional diseases so that, no matter what your trouble is, you will probably find the detailed description of the treatment of a similar case so minutely covered, step by step, to the point of complete recovery that your delight will know no bounds.

Bound in cloth, Price \$2.00

Hair Culture

By BERNARR MACFADDEN

Mr. Macfadden found in his exhaustive investigations that the condition of the hair depends to a large extent on the condition of the blood. Just as it is true that the organs of the body will not function properly without a supply of rich, red blood coursing through them, so it is also true that the hair cannot and will not be healthy—cannot be luxuriant and abundant—unless there is a proper blood supply at its roots.

It makes no difference how many different kinds of tonics you apply to your scalp—it makes no difference how much money you spend in barber shops or beauty parlors, everything is useless unless the simple laws of nature are followed. By following these easy rules, thousands have acquired heads of hair that are the admiration of all—its beautiful gloss, its luxuriant abundance and indeed their crowning glory, and certainly there is no reason why you cannot do the same.

If your comb reveals that you have dandruff, or that your hair is coming out too fast, if your head is too dry or too oily, if you are troubled with baldness in any degree, you owe it to yourself, to your peace of mind, at least to investigate Mr. Macfadden's discovery. Get his book; find out what your hair is, how it grows, why it dies and falls out, why it loses its color, why it becomes brittle. Then read how this simple natural method can quickly end your troubles, stop your loss of hair, end your dandruff and make your hair grow thicker, stronger, more beautiful than perhaps you have dared to hope.

Cloth binding, Price \$2.00

Eating for Health and Strength

By BERNARR MACFADDEN

You have heard all your life of bad combinations of food. When you eat a food combination that is so extremely bad that the stomach positively cannot and will not stand it you become violently nauseated or contract diarrhea. That kind of bad food combination you recognize because *it cannot be ignored*.

But, do you recognize the dozens and dozens of other food combinations that are far worse for you, because while poisonous to the system, are not sufficiently violent to cause ejection? Those are the foods that kill, because instead of being violently cast forth they are absorbed by the system, which becomes saturated with insidious poisons that slowly but surely sap away health and vitality.

"Eating for Health and Strength," is the wonderful new book by Bernarr Macfadden that covers the subject of diet so completely and at the same time in a manner so simple and easily understood that you are enabled to grasp all of the underlying laws of nutrition almost without an effort.

As a health insurance policy this book by the greatest living physical culturist is worth its weight in gold.

SOME CHAPTER HEADS ARE

Food Science and Personal Efficiency.	Practical Food Economy.
The Physiology of Nutrition.	Food and Mental Efficiency.
What to Eat.	Eating to Gain or Reduce Weight.
How Much to Eat.	Food and Sexual Life.
Food Production—Manufacturing and Marketing.	Feeding the Children.
	Eating to Prevent or Cure Disease.

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